



# **AC Transmission Public Policy Transmission Planning Report: Appendices**

**A Report by the  
New York Independent System Operator**

April 8, 2019

## Appendix A – Public Policy Transmission Planning Process Glossary

## AC Transmission Public Policy Planning Report Glossary

Term	Definition
Adequacy	Encompassing both generation and transmission, adequacy refers to the ability of the bulk power system to supply the aggregate requirements of consumers at all times, accounting for scheduled and unscheduled outages of system components.
Article VII	Article VII of the New York State Public Service Law for the siting of major electric transmission facilities in the State of New York.
Congestion Assessment and Resource Integration Study (CARIS)	The Congestion Assessment and Resource Integration Study for economic planning developed by the NYISO in consultation with the Market Participants and other interested parties pursuant to Section 31.3 of Attachment Y.
Comprehensive System Planning Process (CSPP)	The Comprehensive System Planning Process set forth in Attachment Y, and in the Interregional Planning Protocol, which covers reliability planning, economic planning, Public Policy Requirements planning, cost allocation and cost recovery, and the interregional planning process.
Congestion	Congestion on the transmission system results from physical limits on how much power transmission equipment can carry without exceeding thermal, voltage and/or stability limits determined to maintain system reliability.
Contingencies	Contingencies are individual electrical system events (including disturbances and equipment failures) that may occur under certain system conditions.
Developer	A person or entity, including a Transmission Owner, sponsoring or proposing a project pursuant to Attachment Y.

Term	Definition
Electric System Planning Work Group (ESPWG)	A NYISO governance working group for Market Participants designated to fulfill the planning functions assigned to it and that advises the NYISO Operating Committee. The ESPWG provides a forum for stakeholders, Market Participants, and all interested parties to provide input into the NYISO's Comprehensive System Planning Process (CSPP), the NYISO's response to FERC reliability-related Orders and other directives, other system planning activities, policies regarding cost allocation and recovery for regulated reliability, economic, and/or public policy projects, and related matters.
Federal Energy Regulatory Commission (FERC)	The federal energy regulatory agency within the U.S. Department of Energy that approves the NYISO's tariffs and regulates its operation of the bulk electricity grid, wholesale power markets, and planning and interconnection processes.
FERC 715	Annual report that is required by transmitting utilities operating grid facilities that are rated at or above 100 kilovolts. The report consists of transmission systems maps, a detailed description of transmission planning Reliability Criteria, detailed descriptions of transmission planning assessment practices, and detailed evaluation of anticipated system performance as measured against Reliability Criteria.
Installed Capacity (ICAP)	A Generator or Load facility that complies with the requirements in the Reliability Rules and is capable of supplying and/or reducing the demand for Energy in the NYCA for the purpose of ensuring that sufficient Energy and Capacity are available to meet the Reliability Rules. The Installed Capacity requirement, established by the New York State Reliability Council (NYSRC), includes a margin of reserve in accordance with the Reliability Rules.
Installed Reserve Margin (IRM)	The amount of installed electric generation capacity above 100% of the forecasted peak electric demand that is required to meet NYSRC resource adequacy criteria. Most studies in recent years have indicated a need for a 15-20% reserve margin for adequate reliability in the State of New York.
Interregional Planning Protocol	The Amended and Restated Northeastern ISO/RTO Planning Coordination Protocol, or any successor protocol.
Local Transmission Plan (LTP)	The Local Transmission Owner Plan, developed by each Transmission Owner, which describes its respective plans that may be under consideration or finalized for its own Transmission District.
Local Transmission Owner Planning Process (LTPP)	The first step in the Comprehensive System Planning Process (CSPP), under which transmission owners in New York's electricity markets provide their local transmission plans for consideration and comment by interested parties.

Term	Definition
Load and Capacity Report (Gold Book)	The annual NYISO survey of power demand and supply in New York State that is published pursuant to Article 6 of the Energy Law of New York State.
Loss of load expectation (LOLE)	LOLE establishes the amount of generation and demand-side resources needed—subject to the level of the availability of those resources, load uncertainty, available transmission system transfer capability and emergency operating procedures—to minimize the probability of an involuntary loss of firm electric load on the bulk electricity grid. The state’s bulk electricity grid is designed to meet an LOLE that is not greater than one occurrence of an involuntary load disconnection in 10 years, expressed mathematically as 0.1 days per year.
Market Monitoring Unit	A consulting or other professional services firm, or other similar entity, retained by the NYISO Board pursuant to ISO Services Tariff Section 30.4.6.8.1 of Attachment O – Market Monitoring Plan.
Market Participant	An entity, excluding the ISO, that produces, transmits, sells, and/or purchases for resale Capacity, Energy and Ancillary Services in the Wholesale Market. Market Participants include: Transmission Customers under the NYISO OATT, Customers under the NYISO Services Tariff, Power Exchanges, Transmission Owners, Primary Holders, LSEs, Suppliers and their designated agents. Market Participants also include entities buying or selling TCCs.
New York State Bulk Power Transmission Facility (BPTF)	The facilities identified as the New York State Bulk Power Transmission Facilities in the annual Area Transmission Review submitted to NPCC by the NYISO pursuant to NPCC requirements.
New York Control Area (NYCA)	The area under the electrical control of the NYISO. It includes the entire State of New York, and is divided into 11 zones.
New York State Department of Environmental Conservation (NYSDEC)	The agency that implements New York State environmental conservation law, with some programs also governed by federal law.
New York Independent System Operator (NYISO)	Formed in 1997 and commencing operations in 1999, the NYISO is a not-for-profit organization that manages New York’s bulk electricity grid a network of over 11,000 miles of high voltage lines that carry electricity throughout the state. The NYISO also oversees the state’s wholesale electricity markets. The organization is governed by an independent Board of Directors and a governance structure made up of committees with Market Participants and stakeholders as members.

Term	Definition
New York State Department of Public Service (DPS)	As defined in the New York Public Service Law, it serves as the staff for the New York State Public Service Commission.
New York State Public Service Commission (PSC)	The New York State Public Service Commission is the decision making body of the New York State Department of Public Service. The PSC regulates the state's electric, gas, steam, telecommunications, and water utilities and oversees the cable industry. The Commission has the responsibility for setting rates and ensuring that safe and adequate service is provided by New York's utilities. In addition, the Commission exercises jurisdiction over the siting of major gas and electric transmission facilities.
New York State Reliability Council (NYSRC)	A not-for-profit entity that develops, maintains, and, from time-to-time, updates the Reliability Rules which shall be complied with by the New York Independent System Operator (NYISO) and all entities engaging in electric transmission, ancillary services, and capacity and energy transactions on the New York State Power System.
North American Electric Reliability Corporation (NERC)	A not-for-profit organization that develops and enforces reliability standards; assesses reliability annually via 10-year and seasonal forecasts; monitors the bulk power system; and educates, trains, and certifies industry personnel. NERC is subject to oversight by the FERC and governmental authorities in Canada.
Northeast Power Coordinating Council (NPCC)	A not-for-profit corporation responsible for promoting and improving the reliability of the international, interconnected bulk power system in Northeastern North America.
Open Access Transmission Tariff (OATT)	Document of Rates, Terms and Conditions, regulated by the FERC, under which the NYISO provides transmission service. The OATT is a dynamic document to which revisions are made on a collaborative basis by the NYISO, New York's Electricity Market Stakeholders, and the FERC.
Order No. 1000	Order No. 1000 is a Final Rule that reforms the FERC electric transmission planning and cost allocation requirements for public utility transmission providers. The rule builds on the reforms of Order No. 890 and provides for transmission planning to meet transmission needs driven by Public Policy Requirements, interregional planning, opens transmission development for new transmission needs to non-incumbent developers, and provides for cost allocation and recovery of transmission upgrades.
Other Developer	Developer, other than a Transmission Owner, sponsoring or proposing to sponsor a regulated economic project, a Public Policy Transmission Project, an Other Public Policy Project, or a regulated solution to a Reliability Need.

Term	Definition
Other Public Policy Project	A non-transmission project or a portfolio of transmission and non-transmission projects proposed by a Developer to satisfy an identified Public Policy Transmission Need.
Outage	The forced or scheduled removal of generating capacity or a transmission line from service.
Peak Demand	The maximum instantaneous power demand, measured in megawatts (MW), and also known as peak load, that is usually measured and averaged over an hourly interval.
Public Policy Transmission Planning Process	The process by which the NYISO solicits needs for transmission driven by Public Policy Requirements, evaluates all proposed Public Policy Transmission Projects and Other Public Policy Projects on a comparable basis, and selects the more efficient or cost effective Public Policy Transmission Project, if any, for eligibility for cost allocation under the NYISO Tariffs.
Public Policy Transmission Need	A transmission need that is driven by a Public Policy Requirement and identified by the PSC in the NYISO’s Public Policy Transmission Planning Process.
Public Policy Requirement	A federal or New York State statute or regulation, including a PSC order adopting a rule or regulation subject to and in accordance with the State Administrative Procedure Act, any successor statute, or any duly enacted law or regulation passed by a local governmental entity in New York State, that may relate to transmission planning on the BPTFs.
Public Policy Transmission Project	A transmission project or a portfolio of transmission projects proposed by Developer(s) to satisfy an identified Public Policy Transmission Need and for which the Developer(s) seek to be selected by the NYISO for purposes of allocating and recovering the project’s costs under the NYISO OATT.
Reliability Criteria	The electric power system planning and operating policies, standards, criteria, guidelines, procedures, and rules promulgated by the North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC), and the New York State Reliability Council (NYSRC), as they may be amended from time to time.
Reliability Need	A condition identified by the NYISO as a violation or potential violation of Reliability Criteria.
Reliability Needs Assessment (RNA)	A biennial study which evaluates the resource adequacy and transmission system adequacy and security of the New York bulk power system over a ten year Study Period. Through this evaluation, the NYISO identifies Reliability Needs in accordance with applicable Reliability Criteria.

Term	Definition
Reliability Planning Process (RPP)	The biennial process that includes evaluation of resource adequacy and transmission system security of the state’s bulk electricity grid over a 10-year period and evaluates solutions to meet those needs. The RPP consists of two studies: the RNA, which identifies potential problems, and the CRP, which evaluates specific solutions to those problems.
Reliability Rules	Those rules, standards, procedures and protocols developed and promulgated by the NYSRC, including Local Reliability Rules, in accordance with NERC, NPCC, FERC, PSC and NRC standards, rules and regulations, and other criteria and pursuant to the NYSRC Agreement.
State Environmental Quality Review Act (SEQRA)	New York State law requiring the sponsoring or approving governmental body to identify and mitigate the significant environmental impacts of the activity/project it is proposing or permitting.
Site Control	Documentation reasonably demonstrating: (1) ownership of, a leasehold interest in, or a right to develop a site or right of way for the purpose of constructing a proposed project; (2) an option to purchase or acquire a leasehold site or right of way for such purpose; or (3) an exclusivity or other business relationship between the Transmission Owner, or Other Developer, and the entity having the right to sell, lease, or grant the Transmission Owner, or Other Developer, the right to possess or occupy a site or right of way for such purpose.
Study Period	The time period evaluated for the Western New York Public Policy Transmission Need from 2016 through 2045.
Transfer Capability	The measure of the ability of interconnected electrical systems to reliably move or transfer power from one area to another over all transmission facilities (or paths) between those areas under specified system conditions.
Transmission Constraints	Limitations on the ability of a transmission system to transfer electricity during normal or emergency system conditions.
Transmission District	The geographic area in which a Transmission Owner, including LIPA, is obligated to serve Load, as well as the customers directly interconnected with the transmission facilities of the Power Authority of the State of New York.
Transmission Expansion and Interconnection Process	The NYISO’s processes under its Open Access Transmission Tariff (OATT) for parties to pursue construction and interconnection of new and materially modified generation, transmission, and load facilities to the New York State Transmission System or Distribution System.

<b>Term</b>	<b>Definition</b>
Transmission Owner (TO)	A public utility or authority that owns transmission facilities and provides Transmission Service under the NYISO's tariffs.
Transmission Planning Advisory Subcommittee (TPAS)	An identified group of Market Participants that advises the NYISO Operating Committee and provides support to the NYISO Staff in regard to transmission planning matters including transmission system reliability, expansion, and interconnection.
Viability and Sufficiency Assessment	The results of the NYISO's assessment of the viability and sufficiency of proposed solutions to a Public Policy Transmission need under Section 31.4.6 of the NYISO OATT.
Zone	One of the eleven regions in the NYCA connected to each other by identified transmission interfaces and designated as Load Zones A-K.

## Appendix B – Viability and Sufficiency Assessment



# **AC Transmission Public Policy Transmission Need Viability & Sufficiency Assessment**

*A report from the New York Independent System Operator*

**October 27, 2016**

### **Caution and Disclaimer**

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## Executive Summary

The NYISO's Public Policy Transmission Planning Process implements the Federal Energy Regulatory Commission (FERC) Order No. 1000 directive requiring public utility transmission providers to consider in their planning processes transmission needs driven by Public Policy Requirements. The NYISO conducted this Viability and Sufficiency Assessment for the AC Transmission Public Policy Transmission Need to determine whether each proposal submitted by a Developer is complete, viable, and sufficient to satisfy the Public Policy Transmission Need.

The NYISO initiated its first Public Policy Transmission Planning Process by soliciting proposed transmission needs that stakeholders or interested parties believe are driven by Public Policy Requirements. The NYISO filed for consideration by the New York Public Service Commission (NYPSC) the proposed transmission needs and the NYPSC published the proposed needs for public comment pursuant to the State Administrative Procedure Act. NYISO Staff also provided technical support to the New York State Department of Public Service throughout 2014 and 2015, and appeared twice at technical conferences to present its power flow analyses to Developers and parties to the NYPSC AC Transmission proceedings. Upon considering the various comments submitted, the NYPSC issued an order that identified numerous public policies that together constitute Public Policy Requirements driving transmission needs associated with the Central East and UPNY/SENY sections of the New York State Transmission System (collectively named the "AC Transmission Public Policy Transmission Need").

The NYISO established sufficiency criteria in accordance with the criteria set forth by the NYPSC order. The NYISO created the baseline power flow study case and results used in the Trial Staff Final Report in the NYPSC's AC Transmission proceedings, and used that baseline powerflow to conduct its independent analysis of the viability and sufficiency of each proposed project.

The NYISO issued a solicitation for projects to address the AC Transmission Public Policy Transmission Need and received 16 proposals from six developers. The NYISO conducted a comparable analysis for each project in the same manner as it conducted the baseline analysis. Out of the 16 proposed projects, the NYISO identifies 13 viable and sufficient projects to address the AC Transmission Public Policy Transmission Need.

Under the PPTPP, the NYPSC reviews this Viability and Sufficiency Assessment and determines whether the NYISO should continue to evaluate and rank the viable and sufficient transmission solutions as part of the Public Policy Transmission Planning Report.

## 1. Introduction

The NYISO's regional planning process, known as the Comprehensive System Planning Process (CSPP), is comprised of four components: (1) the Local Transmission Owner Planning Process, (2) the Reliability Planning Process, (3) the Economic Planning Process, and (4) the Public Policy Transmission Planning Process (PPTPP).<sup>1</sup> The NYISO also conducts interregional planning with its neighboring control areas under the Northeast Coordinated System Planning Protocol. The PPTPP supports the FERC Order No. 1000 directive requiring public utility transmission providers to consider in their planning processes transmission needs driven by Public Policy Requirements ("Public Policy Transmission Needs"). Section 31.4 of Attachment Y of the NYISO Open Access Transmission Tariff (OATT, or the Tariff) describes the planning process that the NYISO, and all interested parties, shall follow to consider Public Policy Requirements<sup>2</sup> that drive the need for expansions or upgrades to Bulk Power Transmission Facilities (BPTFs).<sup>3</sup> Pursuant to the Tariff, the NYISO conducted this Viability and Sufficiency Assessment for the AC Transmission Public Policy Transmission Need to determine whether each Developer-submitted proposal is complete, viable, and sufficient to satisfy the identified need.

The PPTPP consists of four main steps: (1) the identification of Public Policy Transmission Needs, (2) the proposal of solutions to identified Public Policy Transmission Needs, (3) the evaluation of the viability and sufficiency of proposed transmission and non-transmission solutions to a Public Policy Transmission Need, and (4) upon confirmation of the transmission need by the NYPSC, the evaluation and selection of the more efficient or cost effective Public Policy Transmission Project to satisfy a Public Policy Transmission Need.

For each two-year CSPP cycle, the NYISO initiates the first step of the PPTPP after the draft Reliability Needs Assessment (RNA) results are released in the Reliability Planning Process. In the identification step, the NYISO solicits proposals for transmission needs driven by Public Policy Requirements, and the NYPSC, or Long Island Power Authority (LIPA), as applicable, considers the proposals in order to identify Public Policy Transmission Needs, and the NYPSC determines for which of those the NYISO should solicit solutions. Subsequent to the identification of Public Policy Transmission Needs, the NYISO solicits proposed solutions, and Developers submit Public Policy Transmission Projects and Other Public Policy Projects to satisfy the identified Public Policy Transmission Needs. All submissions, regardless of project type, are evaluated for their viability and sufficiency to meet the Public Policy Transmission Needs.

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<sup>1</sup> See OATT Attachment Y.

<sup>2</sup> A "Public Policy Requirement" is a federal or New York State statute or regulation, including a New York State Public Service Commission (NYPSC) order adopting a rule or regulation subject to and in accordance with the State Administrative Procedure Act, any successor statute, or any duly enacted law or regulation passed by a local governmental entity in New York State, that may relate to transmission planning on the BPTFs.

<sup>3</sup> The BPTFs include all of the facilities designated by the NYISO as a Bulk Power System (BPS) element as defined by the NYSRC and NPCC, as well as other transmission facilities that are relevant to planning the New York State transmission system. The current BPTF list is provided in Appendix B of the 2015 NYISO Area Transmission Review, posted at: [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Documents\\_and\\_Resources/Reliability-Compliance/2015%20CATR%20Appendix%20Files\\_non-CEIL.zip](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Reliability-Compliance/2015%20CATR%20Appendix%20Files_non-CEIL.zip)

A Public Policy Transmission Project is a transmission project or a portfolio of transmission projects proposed by Developer(s) to satisfy an identified Public Policy Transmission Need and for which the Developer(s) seek to be selected by the NYISO for purposes of allocating and recovering the project's costs under the NYISO OATT.<sup>4</sup> An Other Public Policy Project is a non-transmission project or a portfolio of transmission and non-transmission projects proposed by a Developer to satisfy an identified Public Policy Transmission Need. An Other Public Policy Project may consist of transmission, generation, and/or demand-side projects.<sup>5</sup>

Following the NYISO's presentation of the Viability and Sufficiency Assessment, the NYPSC reviews the Viability and Sufficiency Assessment and issues an order explaining whether there continues to be the same transmission need driven by a Public Policy Requirement and, if so, that the NYISO should continue to evaluate transmission solutions to a Public Policy Transmission Need.<sup>6</sup> If the NYPSC concludes that non-transmission solutions should be pursued, the NYPSC will indicate in its order that either: (i) there is no longer a transmission need driven by a Public Policy Requirement that requires the NYISO's evaluation of potential transmission solutions, or (ii) the transmission need should be modified.

If the NYPSC concludes that there is no longer a transmission need driven by a Public Policy Requirement, the NYISO will not perform an evaluation, or make a selection of, a more efficient or cost-effective transmission solution for that planning cycle. If the NYPSC modifies the transmission need driven by a Public Policy Requirement, the NYISO will restart its Public Policy Transmission Planning Process as an out-of-cycle process. This out-of-cycle process will begin with the NYISO's solicitation of Public Policy Transmission Projects to address the modified Public Policy Transmission Need. The NYISO will evaluate the viability and sufficiency of the proposed Public Policy Transmission Projects. The NYISO will then proceed to evaluate the viable and sufficient Public Policy Transmission Projects for purposes of selecting the more efficient or cost-effective transmission solution to the modified Public Policy Transmission Need.

If the NYISO proceeds to the evaluation phase, the NYISO evaluates the proposed Public Policy Transmission Projects that have satisfied the viability and sufficiency requirements and ranks them based on the quality of their satisfaction of numerous metrics. Based on this evaluation, the NYISO may select the more efficient or cost-effective Public Policy Transmission Project to satisfy the Public Policy Transmission Need. A project selected as the more efficient or cost-effective solution is eligible for cost allocation and cost recovery under the NYISO OATT.<sup>7</sup> The assumptions, inputs, methodologies, and results of the NYISO's analysis are published in the Public Policy Transmission Planning Report.

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<sup>4</sup> See OATT § 31.1.

<sup>5</sup> See OATT § 31.1.

<sup>6</sup> The focus of the NYPSC's review is upon whether there continues to be a need for transmission. Comments regarding the technical merits of this Viability and Sufficiency Assessment should be directed to the NYISO through its stakeholder process.

<sup>7</sup> See OATT § 31.5.

## 2. Summary of the Public Policy Transmission Need

On August 1, 2014, the NYISO initiated its first Public Policy Transmission Planning Process by soliciting proposed transmission needs that stakeholders or interested parties believe are driven by Public Policy Requirements. On October 3, 2014, the NYISO filed for consideration by the NYPSC the proposed transmission needs it received from eight entities. On November 12, 2014, the NYPSC published the proposed needs in the State Register in accordance with the State Administrative Procedure Act (SAPA) for comments. Following its receipt and review of comments, the NYPSC continued its efforts in the Alternating Current Transmission Upgrades comparative proceedings (“AC Transmission proceedings”) that culminated in the issuance of the Trial Staff Final Report by the New York State Department of Public Service on September 22, 2015, along with a companion motion recommending that the NYPSC find that there are transmission needs driven by Public Policy Requirements. On October 7, 2015, the NYPSC published a SAPA notice of proposed rulemaking for public comment. Following the comment period, the NYPSC issued an order on December 17, 2015 (“NYPSC Order”)<sup>8</sup> that identified numerous public policies that together constitute Public Policy Requirements driving transmission needs associated with the Central East and UPNY/SENY sections of the New York State Transmission System.<sup>9</sup> The NYPSC referred the Central East (“Segment A”) and UPNY/SENY (“Segment B”) transmission needs (collectively named the “AC Transmission Public Policy Transmission Need”) to the NYISO for the solicitation and evaluation of potential solutions. Figure 1 depicts the two segments of the AC Transmission Public Policy Transmission Need. The NYPSC specifically described the two segments of the transmission need as follows:

### SEGMENT A

#### Edic/Marcy to New Scotland; Princetown to Rotterdam

Construction of a new 345 kV line from Edic or Marcy to New Scotland on existing right-of-way (primarily using Edic to Rotterdam right-of-way west of Princetown); construction of two new 345 kV lines or two new 230 kV lines from Princetown to Rotterdam on existing Edic to Rotterdam right-of-way; decommissioning of two 230 kV lines from Edic to Rotterdam; related switching or substation work at Edic or Marcy, Princetown, Rotterdam and New Scotland.

### SEGMENT B

#### Knickerbocker to Pleasant Valley

Construction of a new double circuit 345 kV/115 kV line from Knickerbocker to Churchtown on existing Greenbush to Pleasant Valley right-of-way; construction of a new double circuit 345 kV/115 kV line or triple circuit 345 kV/115 kV/115 kV line from Churchtown to Pleasant Valley on

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<sup>8</sup> NYPSC Case No. 12-T-0502, *et al.* – Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades, *Order Finding Transmission Needs Driven by Public Policy Requirements* (December 17, 2015).

<sup>9</sup> *Id.* at 66-68.

existing Greenbush to Pleasant Valley right-of-way; decommissioning of a double-circuit 115 kV line from Knickerbocker to Churchtown; decommissioning of one or two double-circuit 115 kV lines from Knickerbocker to Pleasant Valley; construction of a new tap of the New Scotland-Alps 345 kV line and new Knickerbocker switching station; related switching or substation work at Greenbush, Knickerbocker, Churchtown and Pleasant Valley substations.

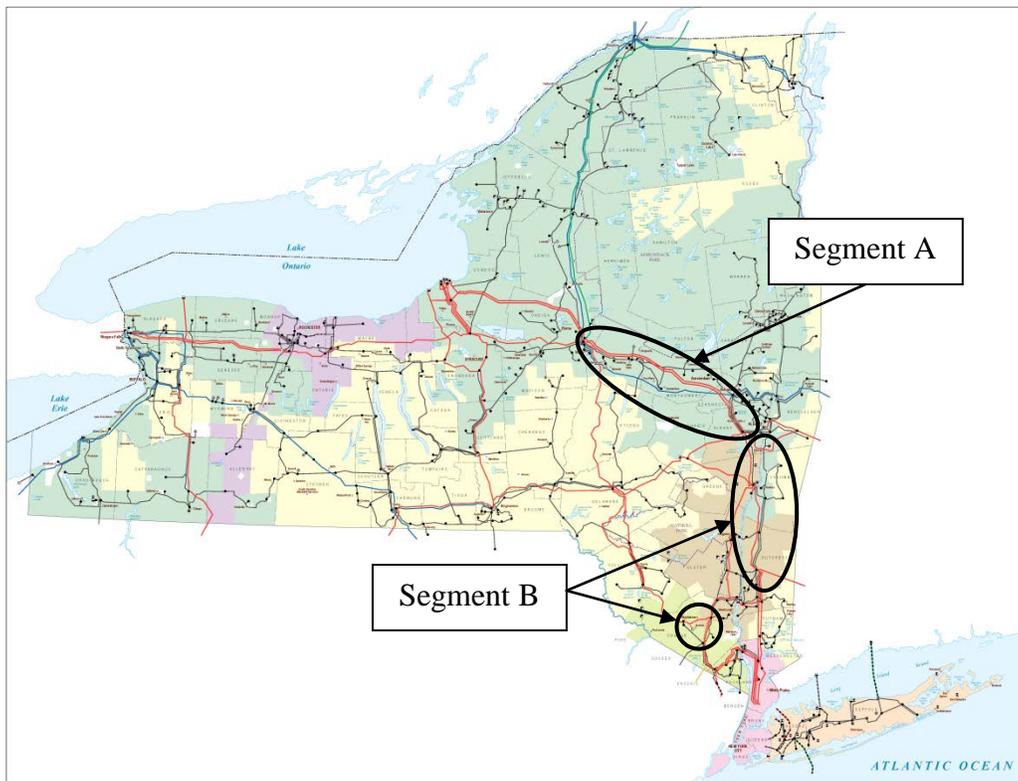
Upgrades to the Rock Tavern Substation

New line traps, relays, potential transformer upgrades, switch upgrades, system control upgrades and the installation of data acquisition measuring equipment and control wire needed to handle higher line currents that will result as a consequence of the new Edic/Marcy to New Scotland; Princetown to Rotterdam and Knickerbocker to Pleasant Valley lines.

Shoemaker to Sugarloaf

Construction of a new double circuit 138 kV line from Shoemaker to Sugarloaf on existing Shoemaker to Sugarloaf right-of-way; decommissioning of a double circuit 69 kV line from Shoemaker to Sugarloaf; related switching or substation work at Shoemaker, Hartley, South Goshen, Chester, and Sugarloaf.<sup>10</sup>

Figure 1: AC Transmission Public Policy Transmission Need



<sup>10</sup> NYPSC Order, Appendix A.

## 2.1. Sufficiency Criteria

The NYISO established sufficiency criteria in accordance with the criteria set forth by the NYPSC Order. The NYISO made a presentation at a combined meeting of the Transmission Planning Advisory Subcommittee and Electric System Planning Working Group on February 5, 2016 to review the NYPSC's determination of Public Policy Requirements, the nature of the resulting AC Transmission Public Policy Transmission Need, and the associated models and assumptions to be used in NYISO's evaluations.<sup>11</sup>

In order to address the AC Transmission Public Policy Transmission Need as identified by the NYPSC, a sufficient Public Policy Transmission Project or Other Public Policy Project shall meet, at a minimum, the following criteria:

- Proposed solutions to Segment A (Central East) must provide at least a 350 MW increase to the Central East interface transfer capability in accordance with Normal Transfer Criteria as defined by the New York State Reliability Council (NYSRC) Reliability Rules.
- Proposed solutions to Segment B (UPNY/SENY) must provide at least a 900 MW increase to the UPNY/SENY interface transfer capability in accordance with Normal Transfer Criteria as defined by the NYSRC Reliability Rules.

Additionally, a sufficient Public Policy Transmission Project shall meet, at a minimum, the following criteria stated in the NYPSC Order:

- Proposed solutions to Segment A (Central East) must include all project components included in Segment A as described in Appendix A of the NYPSC Order.
- Proposed solutions to Segment B (UPNY/SENY) must include all project components included in Segment B as described in Appendix A of the NYPSC Order.
- No acquisition of new permanent transmission rights-of-way, except for *de minimis* acquisitions that cannot be avoided due to unique circumstances. The transfer or lease of existing transmission rights-of-way property or access rights from a current utility company owner to a Developer shall not be considered such an acquisition.
- No crossing of the Hudson River, either overhead, underwater, in riverbed, or underground, or in any other way by any component of the transmission facility.
- For those Public Policy Transmission Projects that were also evaluated in the AC Transmission proceedings, the NYPSC Order states that the cost estimate must not exceed the level estimated by NYPSC Trial Staff for the project, unless the applicant can

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<sup>11</sup> The NYISO presentation is posted on its website under meeting materials at the following link:  
[http://www.nyiso.com/public/markets\\_operations/committees/meeting\\_materials/index.jsp?com=bic\\_espwg](http://www.nyiso.com/public/markets_operations/committees/meeting_materials/index.jsp?com=bic_espwg).

demonstrate that upward estimates are necessary to correct errors or omissions made by NYPSC Trial Staff for the components that were added or adjusted by NYPSC Trial Staff.

Appendix A of this report provides the details of the criteria that the NYISO applied to determine the sufficiency of each proposed Public Policy Transmission Project and Other Public Policy Project to satisfy the AC Transmission Public Policy Transmission Need.

## **2.2. Sufficiency Assessment Methodology**

The process for developing the study cases for the Viability and Sufficiency Assessment is set forth in Section 4 of the NYISO Public Policy Transmission Planning Process Manual. Based on the sufficiency criteria set forth by the NYPSC Order, the NYISO determined that a power flow model is necessary to evaluate the transfer limits of the Central East and UPNY/SENY interfaces. The baseline power flow study case for the AC Transmission Public Policy Transmission Need is the same system representation that the NYISO employed for the Trial Staff Final Report in the AC Transmission proceedings. The NYISO built that case from the NYISO 2014 Comprehensive Reliability Plan base case system representation of the 2019 summer peak load, modified to include the now-planned CPV Valley Energy Center generation plant and associated system deliverability upgrades. The NYISO used that baseline powerflow to conduct its independent analysis of the viability and sufficiency of each proposed project.

The Central East interface represents transmission lines from Utica to Albany and a line from northern New York to Vermont. Central East is typically a voltage-constrained interface; therefore, the NYISO performed a voltage transfer analysis using the PowerGEM TARA software and in accordance with the NYISO Guideline for Voltage Analysis and Determination of Voltage-Based Transfer Limits.<sup>12</sup> To determine the voltage transfer limits, the NYISO created a set of power flow cases with increasing transfer levels by increasing generation upstream of the interface and decreasing generation downstream of the interface. As the transfer level across the interface was increased, the voltage-constrained transfer limit was determined to be the lower of: (1) the pre-contingency power flow at which the pre/post-contingency voltage falls below the voltage limit criteria, or (2) 95% of the pre-contingency power flow at the voltage collapse point, also known as the “tip of the nose” of the post-contingency power-voltage (PV) curve.<sup>13</sup>

The UPNY-SENY interface represents a collection of transmission lines on which power flows from Upstate New York to Southeast New York. UPNY-SENY is historically limited by the thermal capability of the individual transmission lines; therefore, thermal transfer analysis was performed for the interface in accordance with the Normal Transfer Criteria as defined by the NYSRC Reliability Rules. The NYISO used the Siemens PTI PSS® MUST program to perform the thermal transfer

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<sup>12</sup> NYISO Transmission Expansion and Interconnection Manual, Attachment G, NYISO Transmission Planning Guideline #2-1

<sup>13</sup> The “tip of the nose” is the point of voltage collapse, which occurs when reactive capability supporting the transfer of real power is exhausted.

analysis. To determine the thermal transfer limits, the NYISO raised the power flow across the interface by uniformly increasing upstream generation and uniformly decreasing downstream generation. The thermal ratings of transmission lines were monitored while simulating design contingency events. This method provided a consistent measure of changes to interface transfer limits.

### **2.3. Baseline Results**

The baseline power flow study case for the AC Transmission Public Policy Transmission Need used the same system representation as the NYISO employed for the Trial Staff Final Report in the AC Transmission proceedings. Accordingly, the baseline results are the same as those presented at the NYPSC's AC Transmission Technical Conference on October 8, 2015.<sup>14</sup>

The Central East baseline voltage transfer limit is 2,725 MW limited by voltage collapse for a common-tower loss of the Marcy – Coopers Corners and Edic – Fraser 345 kV lines (Lines 40 & 41).

The UPNY-SENY thermal transfer limit for the baseline is 5,113 MW limited by the post-contingency flow on the Leeds – Pleasant Valley 345 kV line reaching the long term emergency (LTE) rating for a common-tower loss of the CPV Valley – Rock Tavern and Coopers Corners – Rock Tavern 345 kV lines (Lines 34 & 42B). In the baseline, the Athens Special Protection System (SPS) is assumed to be in-service through June 2024 and out-of-service thereafter. The Athens SPS allows either of the Leeds – Pleasant Valley and Athens – Pleasant Valley 345 kV lines to be secured to its short term emergency (STE) rating following loss of the other parallel circuit if Athens generation can be dispatched down to reduce the flow to or below LTE ratings within 15 minutes. A 2013 agreement between National Grid and Athens states that the Athens SPS will remain in-service for ten years or until the construction of a permanent physical reinforcement is in place.<sup>15</sup> Based on the foregoing, in NYISO's evaluation of the proposed transmission solutions to Segment B, the Athens SPS was assumed to be retired as of the in-service date of the proposed transmission solutions.

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<sup>14</sup> Power flow analysis for AC Transmission Proceedings is posted at [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Public\\_Policy\\_Documents/AC\\_Transmission\\_PP\\_TN/NYISO\\_AC\\_transmission\\_TechConf\\_2015-10-08v2.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/AC_Transmission_PP_TN/NYISO_AC_transmission_TechConf_2015-10-08v2.pdf)

<sup>15</sup> A National Grid presentation describing the agreement is posted at: [https://www.nyiso.com/public/webdocs/markets\\_operations/committees/bic\\_espwg/meeting\\_materials/2013-01-09/Athens%20%20SPS%20Update.pdf](https://www.nyiso.com/public/webdocs/markets_operations/committees/bic_espwg/meeting_materials/2013-01-09/Athens%20%20SPS%20Update.pdf)

### 3. Proposed Projects and Findings

On February 29, 2016, the NYISO issued a solicitation for Public Policy Transmission Projects and Other Public Policy Projects to address the AC Transmission Public Policy Transmission Need. Project proposals were due on or before April 29, 2016.<sup>16</sup> Following the issuance of the solicitation, the NYISO received numerous questions from interested Developers seeking clarification on the process and the AC Transmission Public Policy Transmission Need. The NYISO summarized the questions and provided responses in a public Frequently Asked Questions (FAQ) document first posted on March 30, 2016 and updated on April 13, 2016.<sup>17</sup>

As a result of the February 29, 2016 solicitation, the NYISO received 15 Public Policy Transmission Projects and one Other Public Policy Project. In accordance with Section 31.4.15 of the NYISO OATT, the NYISO maintains the confidentiality of each proposed solution except for certain basic information until the NYISO determines that the proposed solution is viable and sufficient and the Developer consents to the NYISO's inclusion of its proposed solution and disclosure of details of its project in the Public Policy Transmission Planning Report. Table 1 provides the publicly available information for each of the proposed projects considered.

**Table 1: Proposed Projects**

Developer	Project Name	Category	Type	Location	Size
National Grid / Transco	New York Energy Solution Seg. A	PPTP	AC Transmission	Segment A	N/A
National Grid / Transco	New York Energy Solution Seg. B	PPTP	AC Transmission	Segment B	N/A
NextEra Energy Transmission New York	Enterprise Line: Segment A	PPTP	AC Transmission	Segment A	N/A
NextEra Energy Transmission New York	Enterprise Line: Segment B	PPTP	AC Transmission	Segment B	N/A
NextEra Energy Transmission New York	Enterprise Line: Segment B-Alt	PPTP	AC Transmission	Segment B	N/A
North America Transmission / NYPA	Segment A +765 kV	PPTP	AC Transmission	Segment A	N/A
North America Transmission / NYPA	Segment A Base	PPTP	AC Transmission	Segment A	N/A
North America Transmission / NYPA	Segment A Double Circuit	PPTP	AC Transmission	Segment A	N/A
North America Transmission / NYPA	Segment A Enhanced	PPTP	AC Transmission	Segment A	N/A
North America Transmission / NYPA	Segment B Base	PPTP	AC Transmission	Segment B	N/A
North America Transmission / NYPA	Segment B Enhanced	PPTP	AC Transmission	Segment B	N/A
ITC New York Development	16NYPP1-1A AC Transmission	PPTP	AC Transmission	Segment A	N/A
ITC New York Development	16NYPP1-1B AC Transmission	PPTP	AC Transmission	Segment B	N/A
AvanGrid	Connect New York Recommended	PPTP	HVDC	Segments A and B	1000 MW
AvanGrid	Connect New York Alternative	PPTP	HVDC	Segments A and B	1000 MW
GlidePath	Distributed Generation Portfolio	OPPP	Generation	Orange, Ulster, Putnam, Greene, NY	112 MW

PPTP: Public Policy Transmission Project      OPPP: Other Public Policy Project

The NYISO evaluated the viability and sufficiency of all 16 projects. A sufficient Public Policy Transmission Project or Other Public Policy Project shall increase Central East transfer limit by at least

<sup>16</sup> The AC Transmission Public Policy Transmission Need Project Solicitation is posted at: [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Public\\_Policy\\_Documents/AC\\_Transmission\\_PP\\_TN/AC\\_Transmission\\_PPTN\\_Solution\\_Solicitation\\_2016-02-29.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/AC_Transmission_PP_TN/AC_Transmission_PPTN_Solution_Solicitation_2016-02-29.pdf)

<sup>17</sup> The AC Transmission Public Policy Transmission Need FAQ document is posted at: [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Public\\_Policy\\_Documents/AC\\_Transmission\\_PP\\_TN/AC-Transmission\\_PPTN\\_FAQ\\_2016-04-13.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/AC_Transmission_PP_TN/AC-Transmission_PPTN_FAQ_2016-04-13.pdf)

350 MW if proposed for Segment A, or increase UPNY-SENY transfer limit by at least 900 MW if proposed for Segment B, in accordance with Normal Transfer Criteria as defined by the NYSRC Reliability Rules. The NYISO conducted a comparable transfer limit analysis of each project in the same manner as the baseline analysis. As required by the NYPSC Order, Segment A depends upon Segment B being in place, so Segment A would not be constructed without certainty that Segment B would be constructed.<sup>18</sup> Therefore, to assess the sufficiency of Segment A proposals, the NYISO combined each Segment A project with each Developer's Segment B counterpart projects and performed transfer analysis for Central East on the combined cases.<sup>19</sup> If there was at least one combined case which increases the Central East transfer limit by at least 350 MW, the Segment A project meets this Central East sufficiency criterion.

Additionally, a sufficient Public Policy Transmission Project shall include all the Segment A or Segment B components as applicable, and meet the rights-of-way, river-crossing, and cost-estimate requirements as described in Section 2.1 of this report. Table 2 lists the findings for each proposed solution. Detailed results have been provided individually to each Developer that proposed a Public Policy Transmission Project or Other Public Policy Project for the AC Transmission Public Policy Transmission Need.

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<sup>18</sup> NYPSC Order, Appendix A

<sup>19</sup> The NYISO did not analyze the viability and sufficiency of each Segment A with each Segment B provided by all Developers.

**Table 2: Project Findings**

Developer Name	Project Name	Segment	Includes All Segment A Components?	Includes All Segment B Components?	Meets ROW Acquisition Criterion Except For de minimis?	Meets Hudson River Crossing Criterion?	Meets Cost Estimate Criterion?	Central East Limit Increases 350+ MW ?	UPNY-SENY Limit Increases 900+ MW ?	Sufficient?
National Grid / Transco	New York Energy Solution Seg. A	A	Yes	N/A	Yes	Yes	Yes	Yes	N/A	Yes
NextEra Energy Transmission New York	Enterprise Line: Segment A	A	Yes	N/A	Yes	Yes	N/A	Yes	N/A	Yes
North America Transmission / NYPA	Segment A +765 kV	A	Yes	N/A	Yes	Yes	N/A	Yes	N/A	Yes
North America Transmission / NYPA	Segment A Base	A	Yes	N/A	Yes	Yes	N/A	Yes	N/A	Yes
North America Transmission / NYPA	Segment A Double Circuit	A	Yes	N/A	Yes	Yes	N/A	Yes	N/A	Yes
North America Transmission / NYPA	Segment A Enhanced	A	Yes	N/A	Yes	Yes	N/A	Yes	N/A	Yes
ITC New York Development	16NYPP1-1A AC Transmission	A	Yes	N/A	Yes	Yes	N/A	Yes	N/A	Yes
National Grid / Transco	New York Energy Solution Seg. B	B	N/A	Yes	Yes	Yes	Yes	N/A	Yes	Yes
NextEra Energy Transmission New York	Enterprise Line: Segment B	B	N/A	Yes	Yes	Yes	Yes	N/A	Yes	Yes
NextEra Energy Transmission New York	Enterprise Line: Segment B-Alt	B	N/A	Yes	Yes	Yes	Yes	N/A	Yes	Yes
North America Transmission / NYPA	Segment B Base	B	N/A	Yes	Yes	Yes	N/A	N/A	Yes	Yes
North America Transmission / NYPA	Segment B Enhanced	B	N/A	Yes	Yes	Yes	N/A	N/A	Yes	Yes
ITC New York Development	16NYPP1-1B AC Transmission	B	N/A	Yes	Yes	Yes	N/A	N/A	Yes	Yes
AvanGrid	Connect New York Recommended	A and B	No	No	Yes	No	N/A	Yes	No	No
AvanGrid	Connect New York Alternative	A and B	No	No	Yes	Yes	N/A	Yes	No	No
GlidePath	Distributed Generation Portfolio	N/A	N/A	N/A	N/A	N/A	N/A	No	No	No

## 4. Conclusions

The NYISO performed a comparable analysis of each proposed Public Policy Transmission Project and Other Public Policy Project to confirm that the proposed solution satisfies the AC Transmission Public Policy Transmission Need. The NYISO determined that the following projects meet the sufficiency criteria:

- National Grid / Transco – New York Energy Solution Segment A
- National Grid / Transco – New York Energy Solution Segment B
- NextEra Energy Transmission New York – Enterprise Line: Segment A
- NextEra Energy Transmission New York – Enterprise Line: Segment B
- NextEra Energy Transmission New York – Enterprise Line: Segment B Alt.
- North America Transmission / NYPA – Segment A + 765 kV
- North America Transmission / NYPA – Segment A Base
- North America Transmission / NYPA – Segment A Double Circuit
- North America Transmission / NYPA – Segment A Enhanced
- North America Transmission / NYPA – Segment B Base
- North America Transmission / NYPA – Segment B Enhanced
- ITC New York Development – 16NYPP1-1A AC Transmission
- ITC New York Development – 16NYPP1-1B AC Transmission

For each sufficient project, the Developer of the project is qualified to develop a transmission solution in accordance with Attachment Y of the OATT, the solution is technically practicable, and the Developer has an approach for acquiring any necessary rights-of-way, property, and facilities. Therefore, each sufficient project is also viable.

The NYPSC Order also requires that the Developer must submit at least two project cost estimates for Public Policy Transmission Projects. The first required cost estimate shall presume that all prudently incurred costs will be recovered. The second required cost estimate shall reflect an 80/20 incentive regime to control costs. Accordingly, each Public Policy Transmission Project provided at least two cost estimates.

## 5. Next Steps

The NYISO presented these results at the joint Electric System Planning Working Group (ESPWG) and Transmission Planning Advisory Subcommittee (TPAS) meeting on September 26, 2016. After the issuance of the final Viability and Sufficiency Assessment, the NYISO will submit the Viability and Sufficiency Assessment to the NYPSC for its review. It is expected that, following applicable public notice and comment procedures in accordance with SAPA, the NYPSC will issue an order explaining whether there continues to be a transmission need driven by a Public Policy Requirement and, if so, that the NYISO should continue to evaluate transmission solutions to the AC Transmission Public Policy Transmission Need.<sup>20</sup>

If the NYPSC concludes that transmission solutions should continue to be pursued to address the AC Transmission Public Policy Transmission Need, the NYISO will evaluate the Public Policy Transmission Projects, which were determined to be viable and sufficient and have elected to proceed, for purposes of selecting the more efficient or cost-effective Public Policy Transmission Project that is eligible for cost allocation and cost recovery under the NYISO's tariffs. The NYISO will rank these Public Policy Transmission Projects based on their satisfaction of the metrics set forth in the Tariff and in the NYPSC Order and document its findings in the AC Transmission Public Policy Transmission Planning Report.

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<sup>20</sup> Within 15 Calendar Days following the NYPSC's issuance of an order indicating that the NYISO should proceed with its evaluation of transmission solutions to the Public Policy Transmission Needs, the Developer of a proposed Public Policy Transmission Project that the NYISO has determined is viable and sufficient must notify the NYISO whether it intends for its project to proceed to be evaluated for purposes of the NYISO's selection of the more efficient or cost-effective Public Policy Transmission Project to satisfy the AC Transmission Public Policy Transmission Needs. As part of this notification, the Developer must include its consent to the NYISO's disclosure of the details of its proposed Public Policy Transmission Project in the AC Transmission Public Policy Transmission Planning Report.

## **Appendix A – Sufficiency Criteria**

# AC Transmission Public Policy Transmission Needs

## Sufficiency Criteria and Additional Information

### Sufficiency Criteria (Minimum Criteria)

In order to address the AC Transmission Public Policy Transmission Needs (PPTN) as identified by the NYPSC, a sufficient Public Policy Transmission Project or Other Public Policy Project shall meet, at a minimum, the following criteria:

- Proposed solutions to Segment A (Central East) must provide at least a 350 MW increase to the Central East interface transfer capability in accordance with Normal Transfer Criteria as defined by the New York State Reliability Council (NYSRC) Reliability Rules.
- Proposed solutions to Segment B (UPNY/SENY) must provide at least a 900 MW increase to the UPNY/SENY interface transfer capability in accordance with Normal Transfer Criteria as defined by the NYSRC Reliability Rules.

Additionally, a sufficient Public Policy Transmission Project shall meet, at a minimum, the following criteria stated in the NYPSC Order:

- Proposed solutions to Segment A (Central East) must include all project components included in Segment A as described in Appendix A of the NYPSC Order.
- Proposed solutions to Segment B (UPNY/SENY) must include all project components included in Segment B as described in Appendix A of the NYPSC Order.
- No acquisition of new permanent transmission rights-of-way, except for *de minimis* acquisitions that cannot be avoided due to unique circumstances. The transfer or lease of existing transmission right-of-way property or access rights from a current utility company owner to a Developer shall not be considered such an acquisition.
- No crossing of the Hudson River, either overhead, underwater, in riverbed, or underground, or in any other way by any component of the transmission facility.
- For those Public Policy Transmission Projects that were also evaluated in the NYPSC AC Transmission proceedings, the NYPSC Order states that the cost estimate must not exceed the level estimated by NYPSC Trial Staff for the project, unless the applicant can demonstrate that upward estimates are necessary to correct errors or omissions made by NYPSC Trial Staff for the components that were added or adjusted by NYPSC Trial Staff.<sup>1</sup>

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<sup>1</sup> The NYISO will perform an independent evaluation of Public Policy Transmission Project costs for purposes of its evaluation and selection process under Section 31.4 of Attachment Y to the NYISO OATT. See OATT Attachment Y Section 31.4.8.

## Transmission Evaluation Criteria

For the purposes of evaluation and selection of the more efficient or cost effective Public Policy Transmission Project to address the AC Transmission PPTN, the following criteria identified by the NYPSC Order will be applied in addition to the criteria and metrics defined by Section 31.4.8 of Attachment Y to the NYISO OATT:

- In lieu of establishing an intended in-service year against which project schedules would be evaluated, the NYISO will consider the proposed project schedule for each Public Policy Transmission Project in the evaluation of impacts to congestion and other applicable criteria over the study period. The NYISO will assume that project schedules begin January 1 of a given year following the NYISO's selection and NYPSC Article VII siting approval (*i.e.*, project schedules need not account for the timing of the NYISO or NYPSC processes).
- The selection process will favor Public Policy Transmission Projects that minimize the acquisition of property rights for new substations and substation expansions. For the purpose of this criterion, the transfer or lease of existing property rights from a current utility company owner to a Developer shall not be considered such an acquisition.
- No Public Policy Transmission Project shall be selected for Segment B that does not incorporate certain specified add-ons that would be constructed (*i.e.*, as specified in the NYPSC Order the upgrades to the Rock Tavern Substation and the upgrades to the Shoemaker to Sugarloaf transmission lines), unless the NYISO determines that such add-ons, jointly or severally, are not material to the accomplishment of the purpose a solution for Segment B.
- The selection process for transmission solutions for Segment B shall not use the costs of upgrades to the Rock Tavern Substation and upgrades to the Shoemaker to Sugarloaf transmission lines as a distinguishing factor between Public Policy Transmission Projects.
- No Public Policy Transmission Project shall be selected for Segment A unless a Public Policy Transmission Project is selected for Segment B.
- No Public Policy Transmission Project shall be selected for Segment A except on condition that the Public Policy Transmission Project selected for Segment A shall not be implemented until there is reasonable certainty established in a manner to be determined by the NYISO that the Public Policy Transmission Project selected for Segment B will be implemented.
- The selection process shall favor Public Policy Transmission Projects that result in upgrades to aging infrastructure.
- Project selection will be competitive by Segment (Segment A and Segment B), but synergies produced by selecting a single Developer to provide both segments may be considered.
- The selection process shall not use the percentage rates applied to account for contingencies and revenue requirement as a distinguishing factor between Public Policy Transmission Projects. The NYISO will evaluate costs based on raw construction costs to ensure that all of the proposed Public Policy Transmission Projects are evaluated on a comparable basis as to the scope of costs.

## PPTN-specific Project Information

For each Public Policy Transmission Project, the Developer must submit at least two project cost estimates, as required by the NYPSC Order:

- The first required cost estimate shall presume that all prudently incurred costs will be recovered and there will be no sharing of cost overruns by the Developer.
- The second required cost estimate shall reflect an 80/20 incentive regime to control costs. The NYPSC Order stated its intent that if actual costs come in above a cost estimate, the Developer bears 20% of the cost over-runs, while ratepayers bear 80% of those costs. The NYPSC Order stated its intent that if actual costs come in below a cost estimate, then the Developer should retain 20% of the savings. Furthermore, if the Developer seeks incentives from FERC above the base return-on-equity otherwise approved by FERC, then the Developer shall not receive any incentives above the base return-on-equity on any cost overruns over the cost estimate. The NYPSC Order stated that the cost estimate would therefore cap the costs that may be proposed to FERC for incentives.<sup>2</sup>

## Baseline Study Cases

The baseline study case for the AC Transmission PPTN will be the same system representation as that employed by the NYISO for the Trial Staff Final Report in the NYPSC AC Transmission proceedings. That case is based on the NYISO 2014 Comprehensive Reliability Plan base case system representation of 2019 summer peak load, modified to include the now-planned CPV Valley Energy Center generation plant and associated system deliverability upgrades.

The baseline study cases are available, subject to a Critical Energy Infrastructure Information (CEII) request:

[http://www.nyiso.com/public/webdocs/markets\\_operations/services/customer\\_relations/CEII\\_Request\\_Form/CEII\\_Request\\_Form\\_and\\_NDA\\_complete.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/customer_relations/CEII_Request_Form/CEII_Request_Form_and_NDA_complete.pdf)

## Baseline Study Results

Baseline study results, as presented in the NYPSC AC Transmission proceedings, are publicly available on the NYISO website under Public Policy Documents at:

[http://www.nyiso.com/public/markets\\_operations/services/planning/planning\\_studies/index.jsp](http://www.nyiso.com/public/markets_operations/services/planning/planning_studies/index.jsp)

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<sup>2</sup> The NYISO takes no position on the cost overrun and underrun provisions in the NYPSC Order, but notes that the NYISO's tariff states that FERC determines the scope of transmission costs that may be recovered under the NYISO's tariffs. See OATT Attachment Y Section 31.4.8.2.

## Appendix C – Phase 2 Selection Assumptions

# AC Transmission PPTN: Phase 2 Assumptions

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Dawei Fan

Supervisor, Public Policy and Interregional Planning

**ESPGW**

November 17, 2017



# Agenda

- **Overview of AC Transmission Need**
- **Assumptions for Comparative Evaluation**
- **Next Steps**

# Overview of AC Transmission Need

# Public Policy Planning Process

## ■ Phase I: Identify Needs and Assess Solutions

- NYISO solicits transmission needs driven by Public Policy Requirements
- PSC identifies transmission needs and defines additional evaluation criteria
- NYISO solicits solutions (transmission, generation, or EE/DR)
- NYISO performs Viability and Sufficiency Assessment (VSA)
- PSC reviews assessment and confirms continued transmission need

## ■ Phase II: Transmission Evaluation and Selection

- NYISO staff evaluates viable and sufficient transmission solutions and recommends the more efficient or cost-effective solution
- Stakeholder review and advisory votes at BIC and MC
- NYISO Board may select a transmission solution for purposes of cost allocation and recovery under the NYISO Tariff

# AC TRANSMISSION PPTN

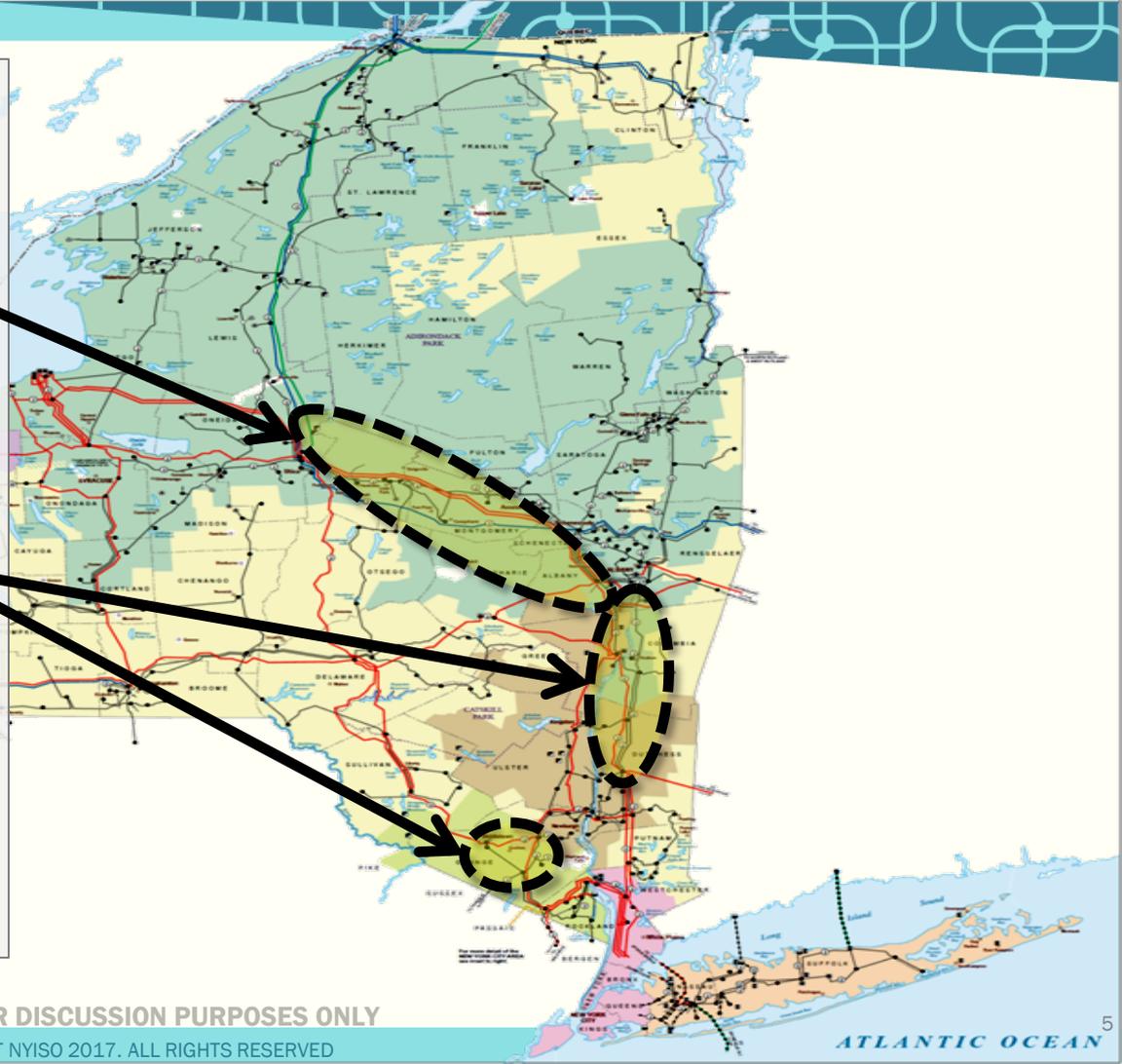
## ■ Segment A (Central East)

- New Edic/Marcy to New Scotland 345 kV line
- Decommission Porter to Rotterdam 230 kV lines
- 230/345 kV connection to Rotterdam

## ■ Segment B (UPNY/SENY)

- New Knickerbocker to Pleasant Valley 345 kV line
- Rock Tavern substation terminal upgrades
- Shoemaker – Sugarloaf 138 kV line

- See PSC Orders for full description



# Viability and Sufficient Transmission Projects

- **13 transmission projects are viable and sufficient**
  - National Grid / Transco – New York Energy Solution Segment A
  - National Grid / Transco – New York Energy Solution Segment B
  - NextEra Energy Transmission New York – Enterprise Line: Segment A
  - NextEra Energy Transmission New York – Enterprise Line: Segment B
  - NextEra Energy Transmission New York – Enterprise Line: Segment B Alt.
  - North America Transmission / NYPA – Segment A + 765 kV
  - North America Transmission / NYPA – Segment A Base
  - North America Transmission / NYPA – Segment A Double Circuit
  - North America Transmission / NYPA – Segment A Enhanced
  - North America Transmission / NYPA – Segment B Base
  - North America Transmission / NYPA – Segment B Enhanced
  - ITC New York Development – 16NYPP1-1A AC Transmission
  - ITC New York Development – 16NYPP1-1B AC Transmission

# Assumptions for Comparative Evaluation

# Overview

- Present assumptions for comparative evaluation
- Solicit feedback from stakeholders
- Evaluate all metrics required by the OATT
- The evaluation of Public Policy Transmission Projects differs from other planning processes because it can give varying levels of consideration to the baseline and the scenarios

# Databases for Comparative Evaluation

- **Power flow:** used in metrics such as transfer limits, cost per MW, operability, and expandability
- **Resource adequacy:** used to analyze LOLE and ICAP benefit
- **Production cost:** used in metrics such as production cost savings, emission, LBMP, load payment, and performance
- **SECO databases:** used in metrics such as overnight capital cost, schedules, property rights, and expandability

# Power Flow Analysis

- **Viability and Sufficiency Assessment: Phase 1 (Completed)**
  - 2014 Reliability Planning Process (RPP) base case representation of 2019 summer peak load
  - Updated to include CPV Valley Energy Center and associated System Deliverability Upgrades
- **Baseline Power Flow Analysis in Phase 2**
  - The same case as used in Phase 1

# Power Flow Analysis

## ■ Scenario Power Flow Analysis in Phase 2

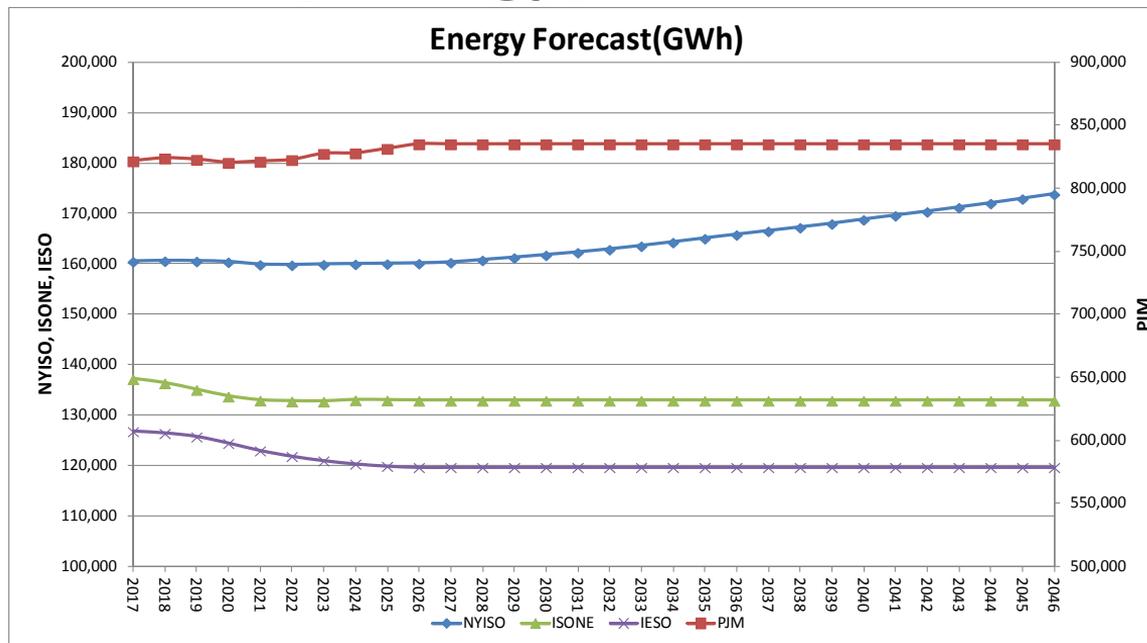
- Start with the 2016 RPP base case representation of 2026 summer peak load
- Updated based on 2017 Gold Book
- Generation:
  - Existing units no longer modeled as deactivated: Ginna, FitzPatrick, and Cayuga
  - Additions: CPV Valley Energy Center, Cricket Valley Energy Center, Bayonne Energy Center II, Greenidge #4, Jericho Rise, Bethlehem Energy Center Uprate, Cassadaga, Arkwright Summit, Eight Point, Shoreham Solar, and Ogdensburg
  - Deactivation: Auburn LFGE, Binghamton, Indian Point Energy Center Units No. 2 & 3
- Transmission:
  - Hudson Transmission Project scheduled at 0 MW
  - ABCJK PARs modeled based on PJM/NYISO JOA
  - Selected Western NY transmission project modeled as in service

# Production Cost Database

## ■ Baseline

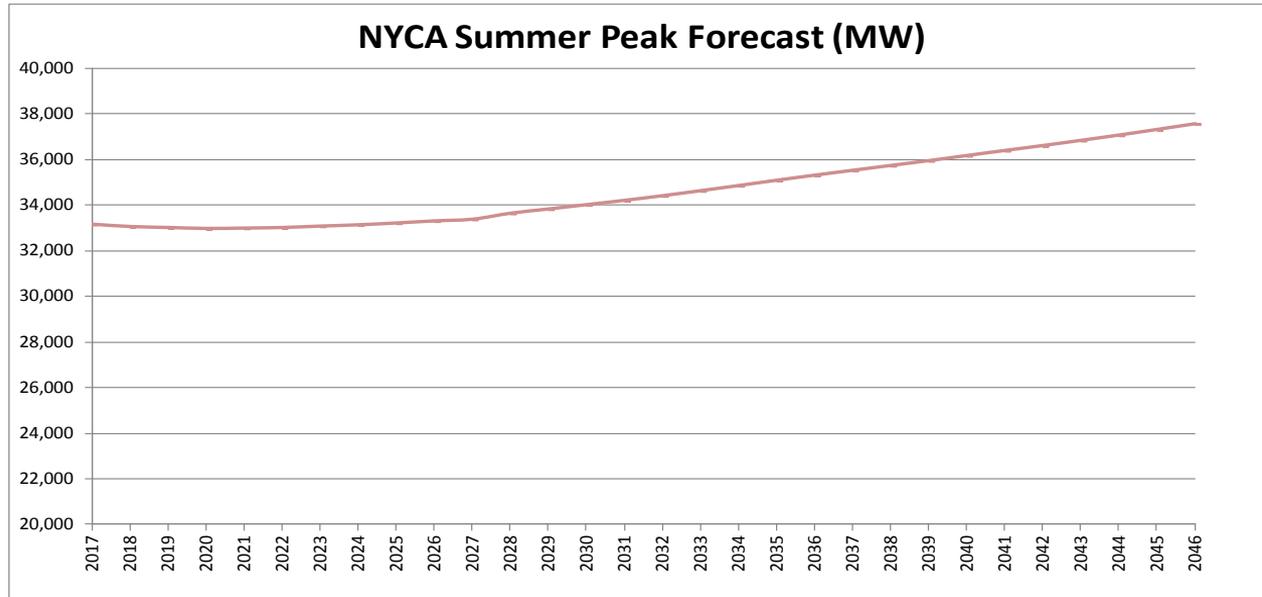
- Start with 2017 CARIS Phase 1 Base Case (2017–2026)
- Updates: Freeport in service, Binghamton out of service, and Indian Point Units No. 2 & 3 out of service
- Extensions: up to 2046
  - Load, fuel, and emission
  - Compensatory MW to maintain a reliable system, if needed

# Load Forecast (Energy)

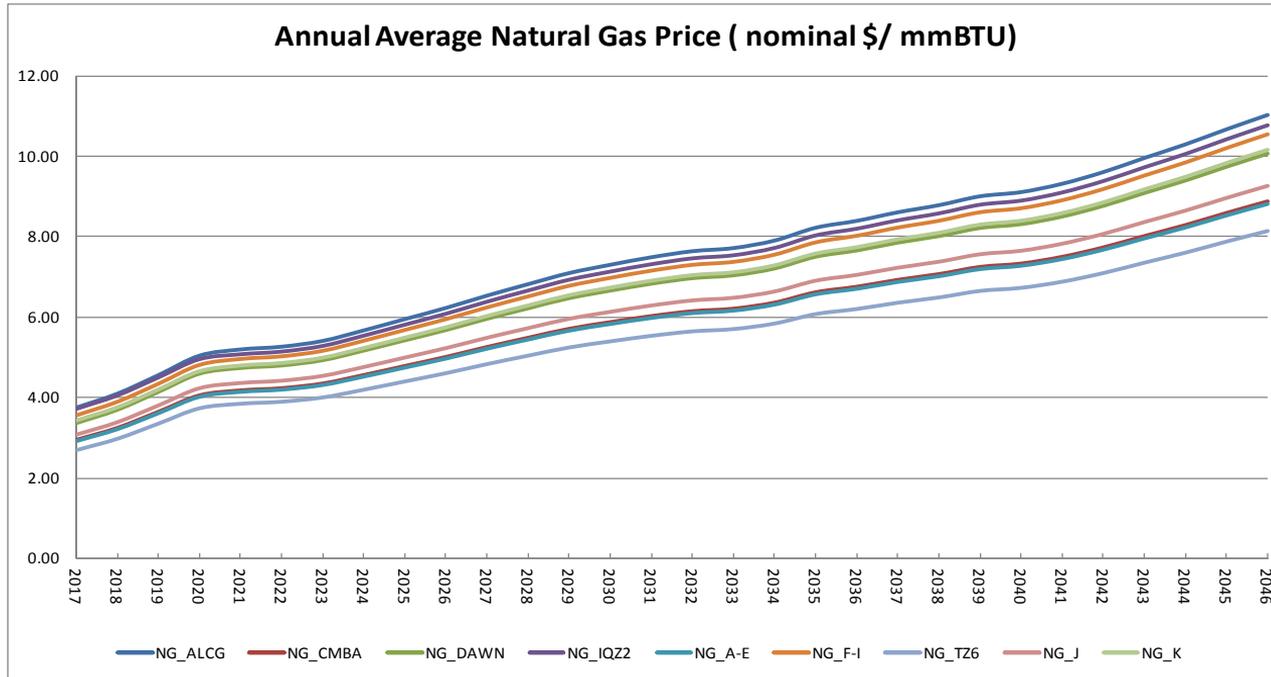


Note: External load frozen starting with the 10<sup>th</sup> year

# Load Forecast (Peak Demand)

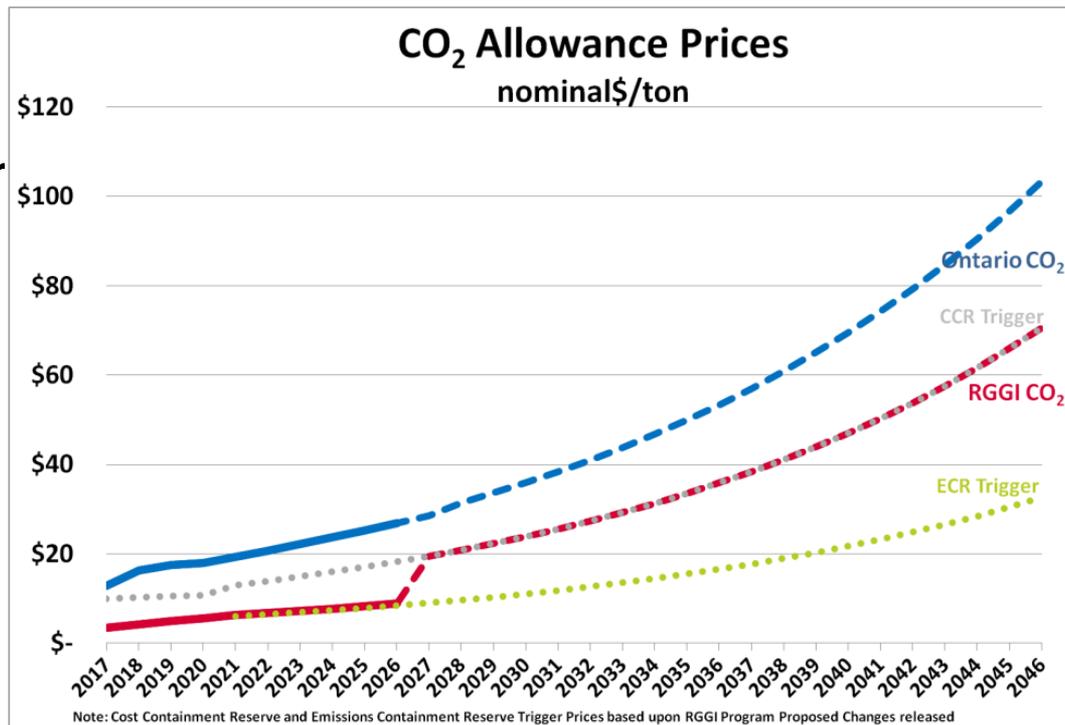


# Natural Gas Price Forecast

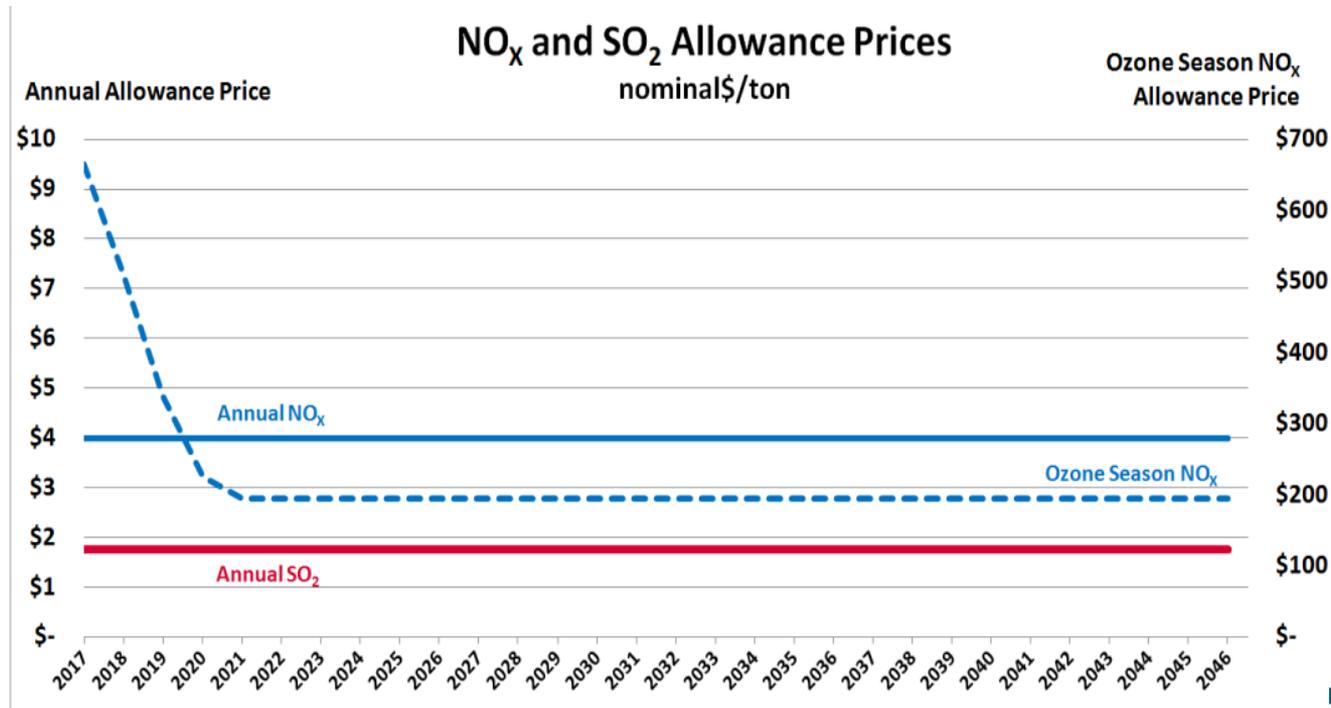


# CO<sub>2</sub> Emission Price Forecast

- 2017 CARIS forecast used through 2026
- Price increase from soft floor to ceiling due to bank of surplus allowance reduced to zero in 2025, load growth, and decline in the allowance cap
- National CO<sub>2</sub> program assumed to start in 2027



# NO<sub>x</sub> and SO<sub>2</sub> Price Forecast



# Production Cost Database

## ■ Potential Scenarios

- Model Clean Energy Standard combined with retirement of aging generation
- No National CO<sub>2</sub> program
- High Natural Gas price
- Low Natural Gas price
- Low NYCA load forecast
- High NYCA load forecast

# Resource Adequacy Analysis

- **Baseline:**
  - Start with 2016 RPP base case
  - Updated based on 2017 Gold Book, and load extended out to 2046
  - Generation:
    - Existing units no longer modeled as deactivated: Ginna, FitzPatrick, and Cayuga
    - Addition: CPV Valley Energy Center, Cricket Valley Energy Center, Bayonne Energy Center II, Greenidge #4, Jericho Rise, Bethlehem Energy Center Uprate, Cassadaga, Arkwright Summit, Eight Point, Shoreham Solar, and Ogdensburg
    - Deactivation: Auburn LFGE, Binghamton, and Indian Point Units No. 2 & 3
  - Transmission:
    - Hudson Transmission Project scheduled at 0 MW
    - Selected Western NY transmission project modeled as in service

# Resource Adequacy Analysis

- Potential Scenarios:
  - Model Clean Energy Standard combined with retirement of aging generation

# Next Steps

# Next Steps

- Further questions and comments regarding AC Transmission Need assumptions and scenarios can be sent to [PublicPolicyPlanningMailbox@nyiso.com](mailto:PublicPolicyPlanningMailbox@nyiso.com) as soon as possible, but no later than December 1, 2017.
- The NYISO tentatively plans to provide the draft results by the end of Q1 2018.

# The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



[www.nyiso.com](http://www.nyiso.com)

## Appendix D – SECO Report

SUBSTATION ENGINEERING COMPANY



# AC Transmission New York Public Policy Transmission Need

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## Technical Review Report

Public Version

Preliminary Draft **3/15/2018**

**Revision 1 3/22/2018**

**Revision 2 3/27/2018**

**Revision 3 3/29/2018**

**Revision 4 4/23/2018**

**Revision 5 5/01/2018**

**Revision 6 5/25/2018**

**Revision 7 6/11/2018**

**Revision 8 6/18/2018**



<b>Client:</b>	NYISO		
<b>Project:</b>	AC Transmission Project Evaluation		
<b>Subject:</b>	Report Draft		
<b>Document No.:</b>	AC Transmission Report 06 18 18	<b>Revision:</b>	8

The independent consultant project team (alternately, “review team,” “consultant,” “reviewer,” or “reviewers”) includes:

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<u>Prakash Pradhan, SECo Sr. Transmission Engineer</u>
<u>Tracy Hollands, SECo Manager of New York Operations</u>
<u>Todd Smith, SECo Lead Substation Designer</u>
<u>Jack Holodak, SECo VP Senior Project Manager</u>
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## 1. Introduction

This report documents the technical evaluation of the thirteen proposals submitted to the New York State Independent System Operator, Inc. (“NYISO”) to satisfy the AC Transmission Public Policy Transmission Needs (AC Transmission PPTN) that the New York Public Service Commission (“NYPSC”) identified in December 2015. In its October 27, 2016 Viability and Sufficiency Assessment Report, the NYISO reported that the thirteen proposals were viable and sufficient and would be able to satisfy the public policy transmission need criteria. Four Developers submitted proposals including National Grid/Transco (“NGRID”), NextEra Energy Transmission New York (“NextEra”), North American Transmission (“NAT”) and New York Power Authority (“NYPA”) collectively (“NAT/NYPA”), and ITC. The thirteen proposals evaluated are:

### SEGMENT A

Proposal Number	Developer	Description
T018	National Grid/Transco (NGRID)	Base proposal
T021	NextEra Energy Transmission New York	Base Proposal
T025	North America Transmission/New York Power Authority (NAT/NYPA)	765 kV Proposal
T026	North America Transmission/New York Power Authority (NAT/NYPA)	Base Proposal
T027	North America Transmission/New York Power Authority (NAT/NYPA)	Double Circuit
T028	North America Transmission/New York Power Authority (NAT/NYPA)	Enhanced
T031	ITC	Base Proposal

### SEGMENT B

Proposal Number	Developer	Description
T019	National Grid/Transco (NGRID)	Base Proposal
T022	NextEra Energy Transmission New York	Base Proposal
T023	NextEra Energy Transmission New York	Alternative
T029	North America Transmission/New York Power Authority (NAT/NYPA)	Base Proposal
T030	North America Transmission/New York Power Authority (NAT/NYPA)	Enhanced
T032	ITC	Base Proposal

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The primary scope and requirements of the AC Transmission PPTN, as identified and described in the NYPSC Order issued on December 17, 2015, is development and construction of the following facilities:

**SEGMENT A: Edic/Marcy to New Scotland; Princetown to Rotterdam**

Construction of new 345 kV line from Edic or Marcy to New Scotland on existing right-of-way (primarily using Edic to Rotterdam right-of-way west of Princetown); construction of two new 345 kV lines or two new 230 kV lines from Princetown to Rotterdam on existing Edic to Rotterdam right-of-way; decommissioning of two 230 kV lines from Edic to Rotterdam; related switching or substation work at Edic or Marcy, Princetown, Rotterdam and New Scotland.

**SEGMENT B: Knickerbocker to Pleasant Valley**

Construction of a new double circuit 345 kV/115 kV line from Knickerbocker to Churchtown on existing Greenbush to Pleasant Valley right-of-way; construction of a new double circuit 345 kV/115 kV line or triple circuit 345 kV/115 kV line from Churchtown to Pleasant Valley on existing Greenbush to Pleasant Valley right-of-way; decommissioning of a double-circuit 115 kV line from Knickerbocker to Churchtown; decommissioning of one or two double-circuit 115 kV lines from Knickerbocker to Pleasant Valley; construction of a new tap of the New-Scotland-Alps 345 kV line and new Knickerbocker switching station; related switching or substation work at Greenbush, Knickerbocker, Churchtown and Pleasant Valley substations.

In addition to the Segment A and Segment B, the NYPSC also identified in the AC Transmission PPTN, upgrades to the Rock Tavern 345 kV Substation and the rebuild of the Shoemaker to Sugarloaf 138 kV line with a new double circuit 138 kV line and related substation work at Shoemaker, Hartley, South Goshen, Chester, and Sugarloaf.

The evaluation conducted by the review team included review of the thirteen proposals received from the NYISO, as well as responses to the Requests For Information (RFIs) issued to the Developers in June, September, and November 2017.

The review team’s evaluation focused on the following areas:

- Site review and “walk down” of proposed sites and routes to evaluate their constructability and identify potential issues with the proposed design, siting and routing;

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- Review of the environmental and permitting requirements for the project as proposed by Developers and identify gaps and issues, which were completed predominately using “desktop” analysis supplemented with occasional field review;
- Evaluate completeness and reasonableness of the proposed project schedules and sequencing plans, including identification of potential issues associated with delay in obtaining permits for and construction of the proposed project;
- Evaluate the Developers’ cost estimates by preparing independent cost estimates for each project;
- Review, identify and estimate real estate requirements;
- Identify risks associated with the projects;
- Determine expandability of proposed project;
- Assess the Developers’ plans for site control; and
- Evaluate the Developers’ operating plans

The review team’s evaluation did not include further evaluation of Developers’ qualifications or credentials beyond the screening performed earlier in the process.

## 2. Executive Summary

This technical review focused primarily on schedule, cost, identifiable risks, the ability to expand on the project in the future, site control plan and availability of Rights of Way (“ROW”), and the operating plan provided by each Developer. Below is a brief summary of our findings. Please see the remainder of the report for further detail.

### 2.1. Schedule

Each Developer’s schedule for permitting and construction of its project was evaluated based on the review team’s collective experience with transmission projects sited by the New York State Public Service Commission (“NYPSC”) under Article VII of the New York State Public Service Law and constructed in New York State. A review of recent Article VII electric transmission projects timelines was completed to identify comparable schedules for obtaining permits and approvals needed to begin construction. The review team also estimated the amount of time required to procure equipment, construct the facilities, and test and commission the facilities in order to be placed into service. A summary of the expected durations for each Developer’s proposed scope is detailed in the table below:

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### Summary of Expected Durations

Segment A Proposals	Developer Proposed Total Duration	Estimated Minimum Duration (Note #1 and #2)
T018 NGRID/Transco Segment A	48 Months	48 Months
T021 NextEra Segment A	29 Months	48 Months
T025 NAT/NYPA Segment A + 765 kV	44 Months	50 Months
T026 NAT/NYPA Segment A Base	44 Months	48 Months
T027 NAT/NYPA Segment A Double Circuit	48 Months	51 Months
T028 NAT/NYPA Segment A Enhanced	44 Months	48 Months
T031 ITC Segment A	39 Months	48 Months
Segment B Proposals	Developer Proposed Total Duration	Estimated Minimum Duration (Note #1)
T019 NGRID/Transco Segment B	48 Months	45 Months
T022 NextEra Segment B	28 Months	43 Months
T023 NextEra Segment B – Alt	29 Months	45 Months
T029 NAT/NYPA Segment B Base	40 Months	45 Months
T030 NAT/NYPA Segment B Enhanced	41 Months	45 Months
T032 ITC Segment B	53 Months	47 Months

Note #1: “Estimated Minimum Duration” is calculated using the anticipated time for Article VII application preparation, the anticipated time for the Article VII approval process, ROW procurement where significant and the anticipated time for construction of the project. The review team also assumed that the Environmental Management and Construction Plan (EM&CP) preparation is completed and ready for submission when the Article VII certificate is received. All of these components will depend on the experience and the level of resources of the developer and the complexity of the project which is further discussed in the risk register. In order to establish a reasonable normal schedule for the purpose of establishing an in-service date an additional four months should be added to the estimated minimum duration.

Note #2: For the Edic to Princetown portion of Segment A, all Developers are proposing to use existing NYPA-owned transmission line structures for about 12.5 miles of their proposed projects. If detailed engineering indicates that the existing structures are inadequate and need to be replaced, the construction schedule may increase by about 4 months, however; this would be consistent across all proposed projects.

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## 2.2. Cost

In evaluating the construction cost of each proposal, Kenny Construction (Kenny) prepared independent cost estimates for each proposal. Kenny reviewed the Developers' proposals with the Developers' cost estimates redacted. GEI Consultants, Inc. estimated the environmental licensing and permitting costs. The results are shown below:

### SEGMENT A (SUMMARY OF ESTIMATES COMPARISON WITH 30% CONTINGENCY)

Developer	Independent Estimate (2018 \$)
T018 National Grid/ NY Transco	\$520,156,065
T021 NextEra Energy	\$497,652,781
T025 NYPA / NAT (Base+765 kV)	\$862,968,398
T026 NYPA / NAT (Base)	\$490,654,542
	\$749,941,620
T027 NYPA / NAT (Double Ckt)	
T028 NYPA / NAT (Enhanced)	\$513,977,889
T031 ITC	\$570,008,025

### SEGMENT B (SUMMARY OF ESTIMATES COMPARISON WITH 30% CONTINGENCY)

Developer	Independent Estimate (2018 \$)
T019 National Grid/ NY Transco	\$479,306,858
T022 NextEra Energy	\$372,564,299
T023 NextEra Energy (Alternate)	\$423,900,414
T029 NYPA / NAT (Base)	\$421,732,556
T030 NYPA / NAT (Enhanced)	\$440,576,906
T032 ITC	\$536,111,604

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**SEGMENT B (SUMMARY OF ESTIMATES COMPARISON WITH 30% CONTINGENCY and Global Addition of \$113M)**

Developer	Independent Estimate (2018 \$)
T019 National Grid/ NY Transco	\$592,306,858
T022 NextEra Energy	\$485,564,299
T023 NextEra Energy (Alternate)	\$536,900,414
T029 NYPA / NAT (Base)	\$534,732,556
T030 NYPA / NAT (Enhanced)	\$553,576,906
T032 ITC	\$649,111,604

Notes:

- Independent Estimates are adjusted to 2018 U.S. Dollars.
- The estimates includes the contingency rate of 30% referenced in the PSC “Order Finding Transmission Needs Driven by Public Policy Requirements” (December 17, 2015) and the Department of Public Service Staff report. The review team agrees that level of contingency is sufficient to allow for unanticipated costs and estimating accuracy to forecast a reasonable worst case cost.
- The Global Additions includes upgrades to the Rock Tavern 345 kV Substation and the rebuild of the Shoemaker to Sugarloaf 138 kV line with a new double circuit 138 kV line and related substation work at Shoemaker, Hartley, South Goshen, Chester, and Sugarloaf at the cost identified by the NYPSC in the AC Transmission Proceedings.
- Includes preliminary costs for Network Upgrade Facilities identified through the respective System Impact Studies.

**2.3. Risk**

- 2.3.1. The review team completed a review of the potential risks associated with the proposals’ schedules and costs, focusing on the most significant drivers, which include:
- Article VII review approval process and potential environmental issues
  - Procurement of major equipment
  - Construction
  - Site Control and procurement of real estate
  - Operational Plan
- 2.3.2. The proposals share many risks in common such as potential delays in preparation and approval of regulatory licenses and permits.
- 2.3.3. The most significant risks associated with the proposals are identified as follows:

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**SEGMENT A**

- Need to obtain additional easements for exceedance of EMF levels. The existing corridor between Princetown Junction and New Scotland Substation (that has 345 kV line #14 and line #18, and 115 kV line #13) is currently estimated to exceed NYS PSC guidelines for EMF levels. The proposed designs improve the condition, but EMF levels are still estimated to exceed the guidelines for all proposals. EMF levels will have to be confirmed during detailed engineering and may result in purchasing EMF easements from property owners along the ROW between Princetown and New Scotland Substations. See Section 4.11.2.4 for more detail.
- For proposal T025 (NAT/NYPA proposal to convert the existing 345 kV line to 765 kV operation) there is a significant risk to the project’s cost and schedule due to (i) potential public opposition, (ii) the potential need to replace the transmission line hardware due to potential corona issues and (iii) additional EMF concerns due to the higher operating voltage of the facility. An allowance was added to the independent cost estimate to account for the potential cost of mitigating corona and EMF issues.

**SEGMENT B**

- The NYPSC encouraged that new structures have minimal increase in height and concluded that height increases of less than 25 feet over existing structures will not create a significant adverse visual impact of a regional nature (December 12, 2015 Order at p. 35). All else being equal, the construction of new structures even with minimal increase in height may increase the risk of public opposition due to their potential local visual impact. The PSC determined that the local visual impacts will be addressed in the Article VII siting proceedings.

**2.4. Expandability**

2.4.1. The review team evaluated the potential for future expansion of the proposed transmission solutions to increase their capacity. Many of the more common design approaches that could be employed on a transmission project to afford future expandability are not applicable since the objective of this project is to utilize existing transmission rights-of-way (ROW) and property. Much of the existing transmission ROW will be fully utilized in construction of this project but there is some opportunity for expansion as described below.

- 2.4.1.1. All proposals for Segment A involve replacement of the existing Porter-Rotterdam 230 kV circuits #30 and #31 with a new Edic to New Scotland 345 kV line. This will provide the space for future use of the existing ROW and may

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allow the addition of another circuit from Edic/Porter to Princetown Junction. During detailed engineering the placement of structures could be optimized to maximize the remaining ROW.

- 2.4.1.2. The proposed new substations provide the potential for future line terminal and transformer additions.

## 2.5. Site Control and Real Estate

2.5.1. In all of the proposals, the following is common for the property rights acquisition process:

- All Developers propose to use existing ROW for their transmission facilities.
- Some additional real estate is required for new substation construction at Princetown Junction
  - NextEra’s project (T021) proposes a new greenfield site located between Princetown Junction and Rotterdam, and has an option to purchase the real estate for the substation
  - ITC’s project (T031) proposes a larger substation at Princetown Junction than the substations proposed by other projects, and will require additional property acquisition
- All Developers have completed preliminary routing of their proposed lines.
- All Developers have documented plans to obtain site control

2.5.2. The non-incumbent Developers all claim common rights in obtaining real property:

- The Developers cite the NYPSC’s December 17, 2015 Order in the AC Transmission proceedings (Case Nos. 12-T-0502, *et al.*) as requiring incumbent utilities to engage in non-discriminatory, good faith negotiation of terms in obtaining the right to use an incumbent utility’s ROW. The Order further stated that “incumbent utilities should offer competitors the same terms they offer Transco; there should be no bias shown to Transco.”

## 2.6. Operational Plan

2.6.1. The review team conducted a review of the Developers’ operations and maintenance plans associated with the proposals. The review team did not identify any major flaws with the Developers’ plans and the plans are essentially the same.

2.6.2. For the non-incumbent Developer proposals, the following aspects are common:

- The Developers stated that all O&M activities will comply with required NERC regulations.
- Proposed facilities will have real-time reporting of operating data.

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- 2.6.3. The non-incumbent Developers proposed the following arrangements for Control Center services:
- ITC proposes to use their Control Center in Novi MI. to provide control center services.
  - NextEra proposes to construct a physical control center in New York to provide control center services.
  - NAT/NYPA proposed to utilize the NYPA Control Center for control center services.

### 3. Discussion of Proposals

Brief descriptions of the proposed projects are provided below.

#### SEGMENT A

##### 3.1. T018 - NGRID/Transco – New Energy Solution Segment A

National Grid/Transco’s NYES Segment A Proposal includes the following components:

- A new 345 kV line of approximately 87 miles from the existing Edic 345 kV substation to the existing New Scotland 345 kV substation. The New Scotland 345 kV Substation will be upgraded and expanded
- Two new 345 kV lines of approximately 5 miles single-circuit looping the existing 345 kV Edic to New Scotland #14 line into and out of a new Rotterdam 345 kV Substation. The Rotterdam 230 kV substation will be retired
- Two new 345/115 kV autotransformers connecting the existing Rotterdam 115 kV switchyard to the new 345 kV switchyard
- One new 345/230 kV autotransformer connecting the existing 230 kV Rotterdam to Eastover Road #38 line to the new Rotterdam 345 kV switchyard
- One new 135 MVAR capacitor bank connected to the new Rotterdam 345 kV switchyard
- Decommissioning of the Porter to Rotterdam 230 kV lines #30 and #31

##### 3.2. T021 – NextEra – Enterprise Line - Segment A

NextEra’s Enterprise Segment A Proposal includes the following components:

- A new 345 kV line of approximately 86 miles (83.4 miles 345 kV line and 2.6 miles double circuit 345/115 kV line) from the existing Edic 345 kV substation to the existing New Scotland 345 kV substation
- Rebuild 2.6 miles of existing Rotterdam-New Scotland 115 kV line circuit #13
- A new breaker-and-a-half 345/230 kV Princetown Substation, located near the existing Rotterdam 230 kV substation. The substation will include two 345/230 kV auto-transformers

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- Two new 345 kV circuits each approximately 4 miles in length to loop the existing Marcy – New Scotland 345 kV circuit #18 into Princetown 345/230 kV substation
- Two new 1 mile 230 kV lines from Princetown-Rotterdam
- Decommissioning of the Porter to Rotterdam 230 kV lines #30 and #31

### 3.3. T025 – NAT/NYPA - Segment A – A + 765 KV

The NAT/NYPA Segment A +765 kV Proposal consists of the following components:

- A new 345 kV line of approximately 86 miles from the existing Edic 345 kV substation to the existing New Scotland 345 kV substation
- Two new 345 kV lines of approximately 5 miles single-circuit looping the existing 345 kV Edic to New Scotland #14 line into and out of a new Rotterdam 345 kV Substation. The Rotterdam 230 kV substation will be retired
- Two new 345/115 kV lower impedance transformers connecting the existing Rotterdam 115 kV switchyard to the new 345 kV switchyard. One new 345/230 kV transformer connecting the existing 230 kV Rotterdam to Eastover Road #38 line to the new Rotterdam 345 kV switchyard
- A new Princetown 345 kV switchyard by tapping the newly proposed Edic-New Scotland lines and Rotterdam-New Scotland transmission lines
- Convert the Marcy – New Scotland and New Scotland – Knickerbocker 345 kV transmission lines to 765 kV operation as Marcy – Knickerbocker 765 kV (with no connection at New Scotland)
- Switching station or substation work at Knickerbocker with two new 2000 MVA 765/345 kV transformers at Knickerbocker
- Terminal upgrades at Edic and Marcy 345 kV substations
- Decommissioning of the Porter to Rotterdam 230 kV lines #30 and #31

### 3.4. T026 – NAT/NYPA - Segment A - Base

NAT/NYPA Segment A Base Proposal consists of the following components:

- A new 345 kV line of approximately 86 miles from the existing Edic 345 kV substation to the existing New Scotland 345 kV substation
- Two new 345 kV lines of approximately 5 miles single-circuit looping the existing 345 kV Edic to New Scotland #14 line into and out of a new Rotterdam 345 kV Substation. The Rotterdam 230 kV substation will be retired
- Two new 345/115 kV transformers connecting the existing Rotterdam 115 kV switchyard to the new 345 kV switchyard. One new 345/230 kV transformer connecting the existing 230 kV Rotterdam to Eastover Road #38 line to the new Rotterdam 345 kV switchyard
- Terminal upgrades at Edic and Marcy 345 kV substations

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- Decommissioning of the Porter to Rotterdam 230 kV lines #30 and #31

### 3.5. T027 – NAT/NYPA Segment A - Double Circuit

NAT/NYPA Segment A Double Circuit Proposal consists of the following components:

- A new 345 kV double circuit line of approximately 86 miles from the existing Edic 345 kV substation to the existing New Scotland 345 kV substation
- Two new 345 kV lines of approximately 5 miles single-circuit looping the existing 345 kV Edic to New Scotland #14 line into and out of a new Rotterdam 345 kV Substation. The Rotterdam 230 kV substation will be retired
- Two new 345/115 kV lower impedance transformers connecting the existing Rotterdam 115 kV switchyard to the new 345 kV switchyard. One new 345/230 kV transformer connecting the existing 230 kV Rotterdam to Eastover Road #38 line to the new Rotterdam 345 kV switchyard
- Rebuild approximately 6 miles of the Rotterdam to New Scotland 345 kV transmission line to accommodate the new double-circuit line beginning from Princetown junction
- Remove the Rotterdam to New Scotland 115 kV transmission line
- A new Princetown 345 kV switchyard by tapping the newly proposed Edic-New Scotland lines and Rotterdam-New Scotland transmission lines
- Terminal upgrades at Edic and Marcy 345 kV substations
- Decommissioning of the Porter to Rotterdam 230 kV lines #30 and #31

### 3.6. T028 – NAT/NYPA Segment A - Enhanced

The NAT/NYPA - Segment A Enhanced Proposal consists of the following components:

- A new 345 kV line of approximately 86 miles from the existing Edic 345 kV substation to the existing New Scotland 345 kV substation
- Two new 345 kV lines of approximately 5 miles single-circuit looping the existing 345 kV Edic to New Scotland #14 line into and out of a new Rotterdam 345 kV Substation. The Rotterdam 230 kV substation will be retired
- Two new 345/115 kV lower impedance transformers connecting the existing Rotterdam 115 kV switchyard to the new 345 kV switchyard. One new 345/230 kV transformer connecting the existing 230 kV Rotterdam to Eastover Road #38 line to the new Rotterdam 345 kV switchyard
- A new Princetown 345 kV switchyard by tapping the newly proposed Edic-New Scotland lines and Rotterdam-New Scotland transmission lines
- Terminal upgrades at Edic and Marcy 345 kV substations
- Decommissioning of the Porter to Rotterdam 230 kV lines #30 and #31

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### 3.7. T031 – ITC Segment A - 16NYPP1-1A

The ITC Segment A Proposal consists of the following components:

- A new Princetown 345 kV switching station tapping the existing Marcy to New Scotland 345 kV #18 line and Edic to New Scotland 345 kV #14 line
- A new Edic – Princetown – New Scotland 345 kV line, rebuilding line #14 between Princetown and New Scotland and sharing the common tower structures with the new line
- A new Rotterdam 345 kV substation with two new 345/230 kV transformers
- Two new Princetown to Rotterdam 345 kV lines of approximately 5.2 miles single circuit
- Decommissioning of the Porter to Rotterdam 230 kV lines #30 and #31

#### **SEGMENT B**

All Segment B projects include terminal upgrades for Coopers Corners – Rock Tavern 345 kV lines to be performed by Central Hudson, and upgrades on Shoemaker – Sugarloaf 138 kV line to be performed by Orange & Rockland.

### 3.8. T019 – NGRID/Transco – New Energy Solution Segment B

National Grid/Transco-NYES Segment B proposal consists of the following components:

- A new double-circuit 345/115 kV line from a new Knickerbocker 345 kV Switching Station to the existing Pleasant Valley Substation, including a rebuild of the Churchtown 115 kV Switching Station and an upgrade of the existing Pleasant Valley 345/115 kV Substation, and 50% series compensation on Knickerbocker to Pleasant Valley 345 kV line
- Two new 135 MVAR 345 kV capacitor banks connected to the Pleasant Valley 345 kV Substation
- Terminal upgrades to the existing Roseton 345 kV Substation and Transition Station to upgrade the thermal ratings on the 345 kV Roseton to East Fishkill #305 line
- Terminal upgrades to the existing New Scotland 345 kV Substation to upgrade the thermal ratings on the 345 kV New Scotland to Knickerbocker #2A line
- Retirement of aging infrastructure including multiple existing 115 kV lines between Greenbush 115 kV Substation and Pleasant Valley 115 kV Substation 345 kV

### 3.9. T022 – NextEra – Enterprise Line - Segment B

NextEra Enterprise Line Segment B proposal consists of the following components:

- Multiple retirements and reconfigurations on 115 kV lines between Greenbush – Pleasant Valley
- New Knickerbocker 345 kV Switchyard, approximately 13 miles southeast of New Scotland along the New Scotland - Alps 345 kV line

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- Loop New Scotland - Alps 345 kV line circuit #2 into Knickerbocker Switchyard
- New North Churchtown 115 kV Switchyard, just north of NYSEG’s existing Churchtown 115 kV switchyard
- A new 345 kV line from a new Knickerbocker 345 kV switching station to the existing Pleasant Valley 345 kV substation (double-circuit 345/115 kV line between Knickerbocker and Churchtown, and single-circuit 345 kV line between Churchtown and Pleasant Valley)

### 3.10. T023 – NextEra– Enterprise Line Segment B

NextEra Enterprise Line Segment B-Alt proposal consists of the following components:

- Multiple retirements and reconfigurations on 115 kV lines between Greenbush – Pleasant Valley
- New Knickerbocker 345 kV Switchyard, approximately 13 miles southeast of New Scotland along the New Scotland - Alps 345 kV line
- Loop New Scotland - Alps 345 kV line circuit #2 into Knickerbocker Switchyard
- New North Churchtown 115 kV Switchyard, just north of NYSEG’s existing Churchtown 115 kV switchyard
- A new double-circuit 345/115 kV line from a new Knickerbocker 345 kV switching station to the existing Pleasant Valley 345 kV substation

### 3.11. T029 – NAT/NYPA Segment B - Base

NAT/NYPA Segment B Base Proposal consists of the following components:

- Multiple retirements and reconfigurations on 115 kV lines between Greenbush – Pleasant Valley
- A new 345 kV Knickerbocker switchyard along the New Scotland - Alps 345 kV line
- Loop the existing 345 kV New Scotland to Alps transmission line into Knickerbocker Switchyard
- A new double-circuit 345/115 kV line from a new Knickerbocker 345 kV switching station to Pleasant Valley 345 kV Substation (double-bundled 345 kV line)
- A new Churchtown 115 kV substation
- Shoemaker – Shoemaker Tap – Middletown 345/138 kV transformer and 138 kV facilities upgrades

### 3.12. T030 – NAT/NYPA Segment B - Enhanced

NAT/NYPA Segment B Enhanced Proposal consists of the components included with the Segment B Base Proposal with use of a triple bundle (instead of double bundle) conductor for the Knickerbocker – Pleasant Valley 345 kV transmission line.

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### 3.13. T032 – ITC Segment B - 16NYPP1-1B

ITC Segment B Proposal consists of the following components:

- Multiple retirements and reconfigurations on 115 kV lines between Greenbush and Pleasant Valley
- A new Knickerbocker 345 kV Substation and a new Knickerbocker 115 kV Substation by tapping the existing 345 kV New Scotland to Alps circuit and Greenbush to Pleasant Valley 115 kV line respectively
- A new 345/115 kV double-circuit line from the Knickerbocker station to Churchtown station on existing Greenbush to Pleasant Valley right-of-way
- A new 345/115/115 kV triple-circuit line from Churchtown to Pleasant Valley on existing Greenbush to Pleasant Valley right-of-way

## 4. Evaluation

### 4.1. Schedule

In evaluating the schedule for the proposed projects, the NYISO OATT section 31.4.8.1.7 provides the following evaluation criteria: “The potential issues associated with delay in constructing the proposed regulated Public Policy Transmission Project consistent with the major milestone schedule and the schedule for obtaining any permits and other certifications as required to timely meet the need.”

The review team has completed an evaluation of the schedules submitted with each proposal. In its evaluation of the proposals, the review team leveraged its collective experience with the development, construction and maintenance of transmission line and substation projects in New York State, and compared the proposed schedules to actual Article VII electric transmission projects completed in the State of New York.

Several Developers appear to assume that the selected project or projects could be subject to an expedited Article VII process. In Case Nos. 12-T-0502, *et al.*, *Proceeding on Motion to Examine Alternating Current Transmission Upgrades*, Order Authorizing Modification of the Process to Allow for Consideration of Alternative Proposals (February 21, 2014), the NYPSC determined that the expedited process proposed in the 2014 State of the State address was not directly applicable to its proceedings and would not be employed.<sup>1</sup>

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<sup>1</sup> *Id.* at pp 3-4 (finding that the proposed expedited process “would apply only to projects that do not require permanent expansion of the right-of-way ‘envelope’ with wider corridors or taller towers” and, thus, “is not directly applicable to this proceeding and will not be employed”).

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Accordingly, the review team’s analysis is based on standard historical durations for siting review. Our conclusion for the Article VII process minimum durations based upon “best case” assumptions is as follows:

**Article VII Process Minimum Durations**

<b>Task</b>	<b>Duration based on construction primarily on Existing ROW</b>
Prepare and submit complete Article VII application (estimate)	6 mo.
PSC issue Certificate (minimum based on past comparable Article VII projects)	12 mo.
Prepare and submit EM&CP (best case: assumes no major changes to design required in Certificate, and prepared during Article VII proceedings)	0 mo.
DPS review and approve EM&CP (based on past comparable Article VII projects)	6 mo.
Total: Best Case Submit Article VII application until Start Construction	18 mo.
Total: Best Case Prepare Article VII application until Start Construction	24 mo.

The main drivers to the project schedule durations considered were:

- Article VII licensing process
- Procurement of major equipment
- Real Estate requirements
- Construction requirements.

The project minimum durations discussed in this evaluation assume that preparation of the Article VII application and real estate procurement negotiations will begin at the time the project is awarded to the Developer and that any preliminary work required has already been completed by the Developer prior to that date. Likewise, the review team assumes that work to file the first EM&CP segment is complete prior to receipt of Article VII Certificate and there are no major changes to the projects’ designs required in the Article VII Certificate.

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The review team developed Gantt chart schedules for each project to show a reasonable time line for each proposal, and appended them to this report as Attachment A.

An evaluation of the construction component of the proposals was completed by Kenny Construction.

Considering that the evaluation focused on establishing reasonable minimum schedule durations, the review team also recommended that some float be added to the schedule to establish a reasonable schedule recognizing the potential for minor delays for the purpose of determining the in-service date once a project is selected. The review team recommends adding 4 months total to each minimum schedule to account for the following float:

- Two months to the construction schedule for each proposal to account for typical slippage of construction activities (*i.e.*, potential weather events, delays if construction crews are needed to respond and provide storm support, unanticipated material and equipment issues, and inability to obtain outages on a timely basis); and
- Two months to the schedule for licensing and permitting activities between the NYPSC issuing the Article VII Certificate and the submittal of the EM&CP to account for possible delays in submitting the EMCP should the PSC require changes to the plan submitted in the application.

**Summarized below are the review team’s findings for Segment A:**

4.1.1. National Grid/Transco Proposal T018 – Segment A

- The Developer included 5 months for Article VII application preparation. Based on experience the review team allocated six months.
- Overall Article VII process schedule is adequate.
- Time for procurement of major equipment is adequate.
- The project is to utilize ROW owned by National Grid and some additional easement to satisfy EMF requirements. The review team believes the Developer has adequate time in its schedule to acquire ROW.
- Overall Construction schedule is adequate.
- The proposed project duration is 48 months. The review team believes that is adequate for this project.

4.1.2. NextEra Proposal T021 – Segment A

- The Developer included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.

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- The Developer included nine months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months.
- NextEra’s schedule is showing that it expects substation EM&CP approval in about 3 months to allow for an earlier start on substation construction. Approval is unlikely to be granted that quickly and the review team believes that approval will take a minimum of six months.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid and some additional easement to satisfy EMF requirements. The review team believes the Developer has adequate time in its schedule to acquire ROW.
- Overall Construction schedule includes 14 months. Based on experience with similar work the review team believes the work will take at least 24 months.
- Their proposed project duration is 29 months. The review team believes that at least 48 months will be required to complete this project.

#### 4.1.3. NAT/NYPA Segment A

##### 4.1.3.1. Proposal T025 – Segment A + 765 kV Proposal

- The Developer included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.
- The Developer included 13 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 20 months. (Two additional months were added to the estimated minimum time period to account for anticipated additional issues associated with the 765 kV line.) The Developer’s schedule is showing start construction at receipt of Article VII Certificate. At least six months will be required for EM&CP approval.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid and some owned by NYPA as well as some additional easement to satisfy EMF requirements. The review team believes the Developer has adequate time in its schedule to acquire ROW.
- Overall Construction schedule is adequate.
- Their proposed project duration is 44 months. The review team believes that at least 50 months will be required to complete this project.

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4.1.3.2. Proposal T026 – Segment A Base Proposal

- The Developer has included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.
- The Developer has included 13 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months. The Developer’s schedule is showing start construction at receipt of Article VII Certificate. At least six months will be required for EM&CP approval.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid and some additional easement to satisfy EMF requirements. The review team believes the Developer has adequate time in its schedule to acquire ROW.
- Overall Construction schedule is adequate.
- The Developer’s proposed project duration is 44 months. The review team believes that at least 48 months will be required to complete this project.

4.1.3.3. Proposal T027 – Segment A Double Circuit

- The Developer has included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.
- The Developer has included 13 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months. The Developer’s schedule is showing start construction at receipt of Article VII Certificate. At least six months will be required for EM&CP approval.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid and some additional easement to satisfy EMF requirements. The review team believes the Developer has adequate time in its schedule to acquire ROW.
- The Developer’s overall Construction schedule of 29 months is adequate. The review team believes that a minimum of 27 months will be required.
- The Developer’s proposed project duration is 48 months. The review team believes that at least 51 months will be required to complete this project.

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#### 4.1.3.4. Proposal T028 – Segment A Enhanced Proposal

- The Developer has included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.
- The Developer has have included 13 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months. The Developer’s schedule is showing start construction at receipt of Article VII Certificate. At least six months will be required for EM&CP approval.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid and some additional easement to satisfy EMF requirements. The review team believes the Developer has adequate time in its schedule to acquire ROW.
- Overall Construction schedule is adequate.
- The Developer’s proposed project duration is 44 months. The review team believes that at least 48 months will be required to complete this project.

#### 4.1.4. ITC Proposal T031 Segment A

- Inconsistencies exist between ITC’s Milestone Schedule Table, Text in Attachment B, and their Gantt Chart which show different dates and durations for their schedule. Attachment C Milestone Schedule Table was used to document the developer proposed durations.
- The Developer has included seven months for Article VII application preparation. Based on experience the review team believes that to be adequate
- The Developer has included 10 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid and some additional easement to satisfy EMF requirements. The review team believes the Developer has adequate time in its schedule to acquire ROW.
- Overall Construction schedule includes 22 months. Based on experience with similar work the review team believes the work will take at least 24 months.
- The Developer’s proposed project duration is 39 months. The review team believes that at least 48 months will be required for this project.

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**Summarized below are the review team’s findings for Segment B:**

4.1.5. National Grid/Transco Proposal T019 – Segment B

- The Developer has included five months for Article VII application preparation. Based on experience the review team would allocate six months.
- Overall Article VII process schedule is adequate.
- Time for procurement of major equipment is adequate.
- The project is to utilize ROW owned by National Grid.
- Overall Construction schedule of 24 months is adequate. The review team estimates that a minimum of 21 months will be required.
- The Developer’s proposed project duration is 48 months. The review team believes that is adequate for this project.

4.1.6. NextEra Segment B Proposals

4.1.6.1. NextEra Proposal T022 – Segment B

- The Developer has included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.
- They have included 9 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months.
- NextEra’s schedule is showing that it expects substation EM&CP approval in about three months to allow for an earlier start on substation construction. The review team believes that it is unlikely for approval to be granted that quickly and believe that approval will take a minimum of six months.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid. The review team believes the Developer has adequate time in its schedule to obtain a lease.
- Overall Construction schedule includes 13 months. Based on experience with similar work the review team believes the work will take at least 19 months.
- The Developer’s proposed project duration is 28 months. The review team believes that at least 43 months will be required to complete this project.

4.1.6.2. NextEra Proposal T023 – Segment B Alt

- The Developer has included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.

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- The Developer has included nine months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months.
- NextEra’s schedule is showing that it expects substation EM&CP approval in about three months to allow for an earlier start on substation construction. The review team believes that it is unlikely for approval to be granted that quickly and believe that approval will take a minimum of six months.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid. The review team believes the Developer has adequate time in its schedule to transfer ownership.
- Overall Construction schedule includes 14 months. Based on experience with similar work the review team believes the work will take at least 21 months.
- The Developer’s proposed project duration is 29 months. The review team believes that at least 45 months will be required to complete this project.

#### 4.1.7. NAT/NYPA Segment B Proposals

##### 4.1.7.1. NAT/NYPA Proposal T029 - Segment B Base

- The Developer has included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.
- The Developer has included 13 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months. The Developer’s schedule is showing start construction at receipt of Article VII certificate. At least six months will be required for EM&CP approval.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid. The review team believes the Developer has adequate time in its schedule to obtain a lease.
- Overall Construction schedule is adequate.
- The Developer’s proposed project duration is 40 months. The review team believes that at least 45 months will be required for this project.

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#### 4.1.7.2. NAT/NYPA Proposal T030 – Segment B Enhanced

- The Developer has included six months for Article VII application preparation. Based on experience the review team believes that to be adequate.
- The Developer has included 13 months for the overall Article VII process (from submission of Article VII application to EM&CP approval). Based on comparable Article VII projects the review team believes that process will take at least 18 months. The Developer’s schedule is showing start construction at receipt of Article VII certificate. At least six months will be required for EM&CP approval.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid. The review team believe the Developer has adequate time in its schedule to obtain a lease.
- Overall Construction schedule is adequate.
- The Developer’s proposed project duration is 41 months. The review team believes that at least 45 months will be required for this project.

#### 4.1.8. ITC Proposal T032 – Segment B

- Inconsistencies exist between ITC’s Milestone Schedule Table, Text in Attachment B, and their Gantt Chart which show different dates and durations for their schedule. Attachment C Milestone Schedule Table was used to document the developer proposed durations.
- ITC’s schedule assumes that Segment A is to be constructed first followed by Segment B and that both segments cannot be constructed at the same time due to outage constraints. The Developer states that if that is not the case, its construction schedule for Segment B could be moved back by one year.
- The Developer has included seven months for Article VII application preparation. Based on experience the review team believes that to be adequate
- Overall Article VII process schedule is adequate.
- Time for procurement of major equipment is adequate.
- The project is to utilize existing ROW owned by National Grid. The review team believes the Developer has adequate time in their schedule to obtain a lease.
- Overall Construction schedule includes 19 months. Based on experience with similar work the review team believes the work will take at least 23 months.
- The Developer’s proposed project duration is 53 months. The review team believes that 47 months is adequate for this project.

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### Conclusion

Based on its review, the review team estimates the following total project durations:

#### Summary of Expected Durations

Segment A Proposals	Developer Proposed Total Duration	Estimated Minimum Duration (Note #1 and #2)
T018 NGRID/Transco Segment A	48 Months	48 Months
T021 NextEra Segment A	29 Months	48 Months
T025 NAT/NYPA Segment A + 765 kV	44 Months	50 Months
T026 NAT/NYPA Segment A Base	44 Months	48 Months
T027 NAT/NYPA Segment A Double Circuit	48 Months	51 Months
T028 NAT/NYPA Segment A Enhanced	44 Months	48 Months
T031 ITC Segment A	39 Months	48 Months

Segment B Proposals	Developer Proposed Total Duration	Estimated Minimum Duration (Note #1)
T019 NGRID/Transco Segment B	48 Months	45 Months
T022 NextEra Segment B	28 Months	43 Months
T023 NextEra Segment B - Alt	29 Months	45 Months
T029 NAT/NYPA Segment B Base	40 Months	45 Months
T030 NAT/NYPA Segment B Enhanced	41 Months	45 Months
T032 ITC Segment B	53 Months	47 Months

Note #1: "Estimated Minimum Duration" is calculated using the anticipated time for Article VII application preparation, the anticipated time for the Article VII approval process, ROW procurement where significant and the anticipated time for construction of the project. The review team also assumed that the EM&CP preparation is completed and ready for submission when the Article VII Certificate is received. All of these components will depend on the experience and the level of resources of the developer and the complexity of the project which is further discussed in the risk register. In order to establish a reasonable normal schedule for the purpose of establishing an in-service date, an additional four months should be added to the estimated minimum duration.

Note #2: For the Edic to Princetown portion of segment A, all developers are proposing to reuse existing NYPA owned transmission line structures for about 12.5 miles. If detailed engineering indicates that the structures are not adequate and need to be replaced the construction schedule may increase by about 4 months however, this would be consistent across all proposed projects.

### 4.2. Cost

In evaluating the cost of a proposed Public Policy Transmission Project, the NYISO OATT section 31.4.8.1.1 specifies the following criteria: "The capital cost estimates for the proposed

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regulated Public Policy Transmission Project, including the accuracy of the proposed estimates. For this evaluation, the Developer shall provide the ISO with credible capital cost estimates for its proposed project, with itemized supporting work sheets that identify all material and labor cost assumptions, and related drawings to the extent applicable and available. The work sheets should include an estimated quantification of cost variance, providing an assumed plus/minus range around the capital cost estimate. The estimate shall include all components that are needed to meet the Public Policy Transmission Need. To the extent information is available, the Developer should itemize: material and labor cost by equipment, engineering and design work, permitting, site acquisition, procurement and construction work, and commissioning needed for the proposed project, all in accordance with Good Utility Practice. For each of these cost categories, the Developer should specify the nature and estimated cost of all major project components and estimate the cost of the work to be done at each substation and/or on each feeder to physically and electrically connect each facility to the existing system. The work sheets should itemize to the extent applicable and available all equipment for: (i) the proposed project, (ii) interconnection facilities (including Attachment Facilities and Direct Assignment Facilities), and (iii) Network Upgrade Facilities, System Upgrade Facilities, System Deliverability Upgrades, Network Upgrades, and Distribution Upgrades.”

#### 4.2.1. Estimate Methodology

Development of the independent cost estimates for the AC Transmission Project was an iterative process utilizing the collective expertise and experience of the review team, and augmented by vendor budgetary quotations. Kenny Construction (Kenny) prepared the independent cost estimates.

A copy of each Developer’s proposals was provided to Kenny with all pricing information redacted. Kenny familiarized itself with the proposals and, in conjunction with SECo, completed field reviews of the impacted facilities.

SECo solicited budgetary quotations from vendors for major equipment including transformers, circuit breakers, GIS equipment, and Series Compensation System. Kenny Construction solicited budgetary quotations for concrete and steel poles, insulators and conductor. Kenny Construction also used historical data from projects it had completed to develop unit pricing for the material supply rates and labor and equipment rates for equipment such as switches, instrument transformers, station service transformers, transmission structures, conductors, grounding and hardware. Kenny purchases large volumes of transmission and substation materials annually.

The Preliminary designs provided by each Developer were used as the basis for the cost estimates. SECo provided engineering input as required to assist Kenny in determining specific

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technical requirements and verifying the Developers’ preliminary designs. Developers’ designs were checked for general compliance with standard industry requirements but they were not optimized.

Indirect cost percentages were derived by Kenny Construction from historical project data. Licensing and environmental cost estimates were developed for each project by SECo’s subcontractor GEI Consultants, Inc..

The draft cost estimates from Kenny were reviewed by SECo for completeness and accuracy. SECo also compared the independent draft cost estimates for the proposals against each other for consistency across the proposals. Lastly, SECo compared each proposal’s draft cost estimates against the Developer’s cost estimates as a check for their reasonableness. If large differences were observed between the independent cost estimate and the Developer’s cost estimate, SECo investigated and determined whether the differences were justified or they were erroneous. If the differences in the cost estimates resulted from errors, they were corrected by Kenny.

The cost estimates were prepared in accordance with the Association for the Advancement of Cost Engineering International Recommended Practice for Class 4 Accuracy. The expected accuracy range typically varies from a low of (-15% to -30%) and high of (+20% to +50%).

**Association for the Advancement of Cost Engineering Criteria for Class 4 Accuracy**

<b>ESTIMATE CLASS</b>	<b>MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES</b> Expressed as % of complete definition	<b>END USAGE</b> Typical purpose of estimate	<b>METHODOLOGY</b> Typical estimating method	<b>EXPECTED ACCURACY RANGE</b> Typical variation in low and high ranges
<b>Class 4</b>	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%

The final cost estimates include the contingency rate of 30% referenced in the NYPSC “Order Finding Transmission Needs Driven by Public Policy Requirements” (Case No. 12-T-0502, et al.)

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December 17, 2015, and the Staff report.<sup>2</sup> The review team agrees that level of contingency is sufficient to allow for unanticipated costs and estimating accuracy to forecast a reasonable worst case cost.

Segment B projects include Global Upgrades to the Rock Tavern 345 kV Substation and the rebuild of the Shoemaker to Sugarloaf 138 kV line with a new double circuit 138 kV line and related substation work at Shoemaker, Hartley, South Goshen, Chester, and Sugarloaf at the cost identified by the NYPSC in the AC Transmission Proceedings<sup>3</sup>.

#### 4.2.2. Potential Synergy Cost Savings

The review team calculated potential cost savings should one Developer be awarded both Segment A and Segment B projects. The savings were derived by evaluating the average cost of individual cost components of the projects to estimate potential cost savings assuming one Developer was awarded both Segment A and Segment B projects. These individual cost components included project shared cost items such as Labor & Equipment, Matting, Materials, Contractor Mobilization/Demobilization, Project Management, Field Construction Management and Inspection Staffing, Incumbent Utility Project Management and Project Oversight, Site Facilities, Material Handling & Storage, Design Engineering, Light Detection and Ranging survey (LiDAR), Geotechnical investigations, Licensing and Permitting, Testing & Commissioning of Transmission Line and Equipment, Contractor Warranties, Legal Fees, and Contractor Markup (Overhead & Profit). Each of these items were assessed for economy of scale; utilization of resources, equipment and materials; duplication of services; and replication of engineering designs to estimate the potential savings. Based on experience with prior transmission construction projects Kenny and SECO estimated a potential synergy savings of five percent (5%).

<sup>2</sup> Item # 14 in Appendix B of the “NYPSC Order Finding Transmission Needs Driven by Public Policy Requirements” dated 12-17-2015 states: The percentage rates applied to account for contingencies and revenue requirement should all be treated uniformly across all estimates so that those factors are not manipulated by the bidders to confuse or artificially skew the results. The selection process shall not use the percentage rates applied to account for contingencies and revenue requirement as a distinguishing factor between bids. For the purposes of bids, all developers should account for contingencies and revenue requirement at the percentage rates provided in the Trial Staff report as a placeholder for the actual rates.

<sup>3</sup> Item # 6 in Appendix B of the December 17, 2015 NYPSC Order Finding Transmission Needs Driven by Public Policy Requirements states: “The selection process for transmission solutions for Segment B shall not use the costs of upgrades to the Rock Tavern Substation and upgrades to the Shoemaker to Sugarloaf transmission lines as a distinguishing factor between bids. The developers shall include the upgrade costs in their bids at the same level using the cost estimates for the upgrades provided in the Trial Staff report as a placeholder for the actual costs.

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#### 4.2.3. Summary of Costs

A summary of the results are shown below:

##### SEGMENT A (SUMMARY OF ESTIMATE COMPARISON)

Developer	Independent Estimate (2018 \$)
T018 National Grid/ NY Transco	\$400,120,050
T021 NextEra Energy	\$382,809,831
T025 NYPA / NAT (Base+765 kV)	\$663,821,844
T026 NYPA / NAT (Base)	\$377,426,571
T027 NYPA / NAT (Double Ckt)	\$576,878,169
T028 NYPA / NAT (Enhanced)	\$395,367,607
T031 ITC	\$438,467,712

##### SEGMENT A (SUMMARY OF ESTIMATES COMPARISON WITH 30% CONTINGENCY)

Developer	Independent Estimate (2018 \$)
T018 National Grid/ NY Transco	\$520,156,065
T021 NextEra Energy	\$497,652,781
T025 NYPA / NAT (Base+765 kV)	\$862,968,398
T026 NYPA / NAT (Base)	\$490,654,542
T027 NYPA / NAT (Double Ckt)	\$749,941,620
T028 NYPA / NAT (Enhanced)	\$513,977,889
T031 ITC	\$570,008,025

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**SEGMENT B (SUMMARY OF ESTIMATE COMPARISON)**

Developer	Independent Estimate (2018 \$)
T019 National Grid/ NY Transco	\$368,697,583
T022 NextEra Energy	\$286,587,923
T023 NextEra Energy (Alternate)	\$326,077,242
T029 NYPA / NAT (Base)	\$324,409,659
T030 NYPA / NAT (Enhanced)	\$338,905,312
T032 ITC	\$412,393,542

**SEGMENT B (SUMMARY OF ESTIMATES COMPARISON WITH 30% CONTINGENCY)**

Developer	Independent Estimate (2018 \$)
T019 National Grid/ NY Transco	\$479,306,858
T022 NextEra Energy	\$372,564,299
T023 NextEra Energy (Alternate)	\$423,900,414
T029 NYPA / NAT (Base)	\$421,732,556
T030 NYPA / NAT (Enhanced)	\$440,576,906
T032 ITC	\$536,111,604

**SEGMENT B (SUMMARY OF ESTIMATES COMPARISON WITH 30% CONTINGENCY and Global Addition of \$113M)**

Developer	Independent Estimate (2018 \$)
T019 National Grid/ NY Transco	\$592,306,858
T022 NextEra Energy	\$485,564,299
T023 NextEra Energy (Alternate)	\$536,900,414
T029 NYPA / NAT (Base)	\$534,732,556
T030 NYPA / NAT (Enhanced)	\$553,576,906
T032 ITC	\$649,111,604

**Notes:**

- Independent Estimates are adjusted to 2018 U.S. Dollars.

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- The estimates include the contingency rate of 30% referenced in the PSC “Order Finding Transmission Needs Driven by Public Policy Requirements” (December 17, 2015) and the Department of Public Service Staff report.. The review team agrees that level of the contingency is sufficient to allow for unanticipated costs and estimating accuracy to forecast a reasonable worst case cost.
- The Global Addition includes upgrades to the Rock Tavern 345 kV Substation and the rebuild of the Shoemaker to Sugarloaf 138 kV Substation with a new double circuit 138 kV line and related substation work at Shoemaker, Hartley, South Goshen, Chester, and Sugarloaf at the cost identified by the NYPSC in the AC Transmission Proceedings.
- Includes preliminary costs for Network Upgrade Facilities identified in the respective System Impact Studies.

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The following tables highlight the significant technical differences between the proposals that drive the differences in estimated costs. Items shown in red would tend to increase costs while those shown in green tend to lower costs.

<b>Comparison of Significant Technical Differences Between Proposals for Segment A</b>					
Developer	Project	Major Technical Differences in Proposals			
		Princeton Substation	Rotterdam Substation	Transmission Lines	Other
NGRID/ Transco	T018	No	Rebuilds with GIS and includes 345 kV Capacitor	Proposed heavier structures than NAT/NYPA, which has a similar design. Concrete foundations on all structures other than H-pole tangent structures.	
NextEra	T021	Includes Princeton at new site. Includes (2) 345-230 kV transformers and 230 kV yard	No, retains existing Rotterdam	Monopole Design - less ROW required. Concrete Poles	
NAT/NYPA	T025 A+765 kV	Yes	Rebuilds, no capacitor	Direct embedded tangent structures	765 kV line (converted from 345 kV) and new Knickerbocker 765 kV Substation
	T026 Base	No	Rebuilds, no capacitor		
	T027 Double circuit	Yes, is GIS	Rebuilds, no capacitor	Double Circuit Edic to NS	
	T028 Enhanced	Yes	Rebuilds, no capacitor	Same as T026, but adds Princeton Sub	
ITC	T031	Yes -with all 8 lines terminated.	Adds new 345/230 kV Transformers and retains existing station	Rebuilds #14 line from Princeton to New Scotland. Has approx. 15% more transmission structures	

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Comparison of Significant Technical Differences Between Proposals for Segment B					
Developer	Project	Major Technical Differences in Proposals			
		Churchtown Substation	Other Substations	Transmission Lines	Other
NGRID/ Transco	T019	Complete Rebuild	Includes 345 kV Series Comp. at Knickerbocker, Capacitors at P.V., Breakers at Schodak 115 kV	Proposed heavier structures than NAT/NYPA. Concrete foundations on all structures	
NextEra	T022	New "North" Churchtown and retains existing Churchtown SS.		Monopole Design - less ROW required. Concrete Poles. Does not include replacement of 32 miles of Circuits 12 and 13.	
	T023 ALT	Similar to T022 but has one less line terminal		Includes replacement of 32 miles of 115 kV Churchtown to P.V.	
NAT/NYPA	T029 Base	Complete Rebuild	Breakers at Schodak		
	T030 Enhanced	Complete Rebuild	Breakers at Schodak	Same as T029 but triple bundled 345 kV conductor	
ITC	T032	Adds breaker at existing station, and builds new Knickerbocker 115 kV		Has approx. 15% more transmission structures	

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A summary of the independent cost estimates (raw costs - not including contingency or Global Additions - in \$1,000's) for each Developer's proposal follows:

**Segment A Proposals:**

**4.2.4. T018 National Grid/Transco Segment A**

<b>National Grid and NY Transco (T018)</b>			
<b>Description</b>		<b>Total Amount (In thousand \$)</b>	
<b>Direct Cost</b>	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$52,139
	1.2	Foundations	\$38,037
	1.3	Structures	\$67,033
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$35,990
	1.5	Insulators, Fitting and Hardware	\$10,840
	Subtotal (1)		<b>\$204,039</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,141
	2.2	Edic Substation	\$2,117
	2.3	Princetown Substation	\$0
	2.4	New Scotland Substation	\$7,037
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,459	
Subtotal (2)		<b>\$66,301</b>	
Total (1+2)		\$270,340	
Contractors Mark-up (15% of Total 1+2)		\$40,551	
Total Direct Cost (A)		<b>\$310,891</b>	
<b>Indirect Cost</b>	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,711
	3.2	Project Management, Material Handling & Amenities	\$18,402
	3.3	Engineering	\$18,121
	3.4	Testing & Commissioning	\$1,559
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$20,144
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,719
Total Indirect Cost (3)		<b>\$77,575</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$388,466</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project	\$0	
4.2	NUF identified during Evaluation	\$0	
Subtotal NUF Cost (C)		<b>\$0</b>	
Total Project Cost (B+C) 2017 \$		<b>\$388,466</b>	
Total Project Cost 2018 \$		<b>\$400,120</b>	

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#### 4.2.5 T021 NextEra Segment A

<b>NextEra Energy (T021)</b>		
<b>Description</b>		<b>Total Amount (In thousand \$)</b>
<b>Direct Cost</b>	<b>1 Transmission Lines</b>	
	1.1 Clearing & Access	\$55,279
	1.2 Foundations	\$18,318
	1.3 Structures	\$74,701
	1.4 Conductor, Shieldwire and Optical Ground Wire	\$38,661
	1.5 Insulators, Fitting and Hardwares	\$18,280
	Subtotal (1)	<b>\$205,239</b>
	<b>2 Substations</b>	
	2.1 Rotterdam Substation	\$850
	2.2 Edic Substation	\$2,153
	2.3 Princetown Substation	\$40,296
	2.4 New Scotland Substation	\$6,883
	2.5 Porter Substation	\$546
	2.6 Knickerbocker Substation	\$0
	2.7 Marcy Substation	\$0
2.8 Substation Interconnections	\$4,378	
Subtotal (2)	<b>\$55,107</b>	
Total (1+2)	<b>\$260,346</b>	
Contractors Mark-up (15% of Total 1+2)	\$39,052	
Total Direct Cost (A)	<b>\$299,398</b>	
<b>Indirect Cost</b>	<b>3 Technical Services Costs</b>	
	3.1 Contractor Mobilization / Demobilization	\$2,603
	3.2 Project Management, Material Handling & Amenities	\$18,440
	3.3 Engineering	\$17,327
	3.4 Testing & Commissioning	\$1,435
	3.5 Permitting, Real Estate, Sales Tax and Additional Costs	\$15,672
	3.6 Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7 Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,865
	Total Indirect Cost (3)	<b>\$72,262</b>
Subtotal Project Cost (B=A+3) 2017 \$	<b>\$371,660</b>	
<b>4 Network Upgrade Facilities (NUF)</b>		
4.1 NUF proposed as element of the Project	\$0	
4.2 NUF identified during Evaluation	\$0	
Subtotal NUF Cost (C)	<b>\$0</b>	
Total Project Cost (B+C) 2017 \$	<b>\$371,660</b>	
Total Project Cost 2018 \$	<b>\$382,810</b>	

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#### 4.2.6 T025 NAT/NYPA Segment A + 765 kV

<b>NY Power Authority and North American Transmission (T025)</b>			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$54,770
	1.2	Foundations	\$35,794
	1.3	Structures	\$67,800
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$37,454
	1.5	Insulators, Fitting and Hardwares	\$13,068
	Subtotal (1)		<b>\$208,887</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$47,629
	2.2	Edic Substation	\$2,153
	2.3	Princetown Substation	\$12,713
	2.4	New Scotland Substation	\$0
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$67,167
	2.7	Marcy Substation	\$17,553
2.8	Substation Interconnections	\$8,301	
Subtotal (2)		<b>\$156,062</b>	
Total (1+2)		\$364,949	
Contractors Mark-up (15% of Total 1+2)		\$54,742	
Total Direct Cost (A)		<b>\$419,691</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$3,649
	3.2	Project Management, Material Handling & Amenities	\$20,483
	3.3	Engineering	\$26,265
	3.4	Testing & Commissioning	\$3,851
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$28,307
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$9,589
Total Indirect Cost (3)		<b>\$101,064</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$520,756</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project (Marcy and Edic Terminals)	\$7,727	
4.2	NUF identified during Evaluation (765kV Corona Mitigation)	\$116,005	
Subtotal NUF Cost (C)		<b>\$123,731</b>	
Total Project Cost (B+C) 2017 \$		<b>\$644,487</b>	
Total Project Cost 2018 \$		<b>\$663,822</b>	

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#### 4.2.7 T026 NAT/NYPA Segment A Base

NY Power Authority and North American Transmission (T026)			
Description		Total Amount (In thousand \$)	
Direct Cost	1	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$50,021
	1.2	Foundations	\$23,713
	1.3	Structures	\$60,645
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$35,492
	1.5	Insulators, Fitting and Hardwares	\$11,907
	Subtotal (1)		<b>\$181,777</b>
	2	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,340
	2.2	Edic Substation	\$2,153
	2.3	Princetown Substation	\$0
	2.4	New Scotland Substation	\$5,264
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
	2.8	Substation Interconnections	\$8,301
	Subtotal (2)		<b>\$64,603</b>
	Total (1+2)		\$246,381
Contractors Mark-up (15% of Total 1+2)		\$36,957	
Total Direct Cost (A)		<b>\$283,338</b>	
Indirect Cost	3	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,464
	3.2	Project Management, Material Handling & Amenities	\$18,148
	3.3	Engineering	\$16,643
	3.4	Testing & Commissioning	\$1,523
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$19,753
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,920
Total Indirect Cost (3)		<b>\$75,369</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$358,707</b>	
4	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project (Marcy and Edic Terminals)	\$7,727	
4.2	NUF identified during Evaluation	\$0	
Subtotal NUF Cost (C)		<b>\$7,727</b>	
Total Project Cost (B+C) 2017 \$		<b>\$366,434</b>	
Total Project Cost 2018 \$		<b>\$377,427</b>	

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#### 4.2.8 T027 NAT/NYPA Segment A Double Circuit

NY Power Authority and North American Transmission (T027)			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$56,801
	1.2	Foundations	\$31,116
	1.3	Structures	\$106,166
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$62,279
	1.5	Insulators, Fitting and Hardwares	\$26,553
	Subtotal (1)		<b>\$282,915</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,340
	2.2	Edic Substation	\$5,333
	2.3	Princetown Substation	\$29,872
	2.4	New Scotland Substation	\$7,717
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,301	
Subtotal (2)		<b>\$100,109</b>	
Total (1+2)		\$383,023	
Contractors Mark-up (15% of Total 1+2)		\$57,453	
Total Direct Cost (A)		<b>\$440,477</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$3,830
	3.2	Project Management, Material Handling & Amenities	\$22,218
	3.3	Engineering	\$25,799
	3.4	Testing & Commissioning	\$2,557
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$26,351
	3.6	Compensation for use of NYPA Structures (2 Circuit)	\$17,838
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$8,278
Total Indirect Cost (3)		<b>\$106,872</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$547,348</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project (Marcy and Edic Terminals)	\$7,727	
4.2	NUF identified during Evaluation ( Everett - Wolf Road 115kV Upgrade)	\$5,000	
Subtotal NUF Cost (C)		<b>\$12,727</b>	
Total Project Cost (B+C) 2017 \$		<b>\$560,075</b>	
Total Project Cost 2018 \$		<b>\$576,878</b>	

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#### 4.2.9 T028 NAT/NYPA Segment A Enhanced

<b>NY Power Authority and North American Transmission (T028)</b>			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$50,021
	1.2	Foundations	\$23,713
	1.3	Structures	\$60,645
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$35,494
	1.5	Insulators, Fitting and Hardwares	\$11,907
	Subtotal (1)		<b>\$181,780</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,340
	2.2	Edic Substation	\$2,153
	2.3	Princetown Substation	\$12,718
	2.4	New Scotland Substation	\$5,264
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,301	
Subtotal (2)		<b>\$77,322</b>	
Total (1+2)		\$259,101	
Contractors Mark-up (15% of Total 1+2)		\$38,865	
Total Direct Cost (A)		<b>\$297,967</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,591
	3.2	Project Management, Material Handling & Amenities	\$18,417
	3.3	Engineering	\$17,763
	3.4	Testing & Commissioning	\$1,840
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$20,533
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$8,096
Total Indirect Cost (3)		<b>\$78,159</b>	
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$376,125</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	Network upgrade facility proposed as element of the Project (Marcy and Edic Terminals)	\$7,727	
4.2	Network upgrade facility identified during Evaluation	\$0	
Subtotal NUF Cost (C)		<b>\$7,727</b>	
<b>Total Project Cost (B+C) 2017 \$</b>		<b>\$383,852</b>	
<b>Total Project Cost 2018 \$</b>		<b>\$395,368</b>	

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#### 4.2.10. T031 ITC Segment A

<b>ITC (T031)</b>		
<b>Description</b>		<b>Total Amount (In thousand \$)</b>
<b>Direct Cost</b>	<b>1 Transmission Lines</b>	
	1.1 Clearing & Access	\$53,084
	1.2 Foundations	\$43,503
	1.3 Structures	\$80,620
	1.4 Conductor, Shieldwire and Optical Ground Wire	\$41,525
	1.5 Insulators, Fitting and Hardwares	\$18,615
	Subtotal (1)	<b>\$237,347</b>
	<b>2 Substations</b>	
	2.1 Rotterdam Substation	\$19,805
	2.2 Edic Substation	\$2,185
	2.3 Princetown Substation	\$27,974
	2.4 New Scotland Substation	\$3,615
	2.5 Porter Substation	\$546
	2.6 Knickerbocker Substation	\$0
2.7 Marcy Substation	\$0	
2.8 Substation Interconnections	\$8,383	
Subtotal (2)	<b>\$62,507</b>	
	Total (1+2)	\$299,855
	Contractors Mark-up (15% of Total 1+2)	\$44,978
	Total Direct Cost (A)	<b>\$344,833</b>
<b>Indirect Cost</b>	<b>3 Technical Services Costs</b>	
	3.1 Contractor Mobilization / Demobilization	\$2,999
	3.2 Project Management, Material Handling & Amenities	\$18,925
	3.3 Engineering	\$19,832
	3.4 Testing & Commissioning	\$1,560
	3.5 Permitting, Real Estate, Sales Tax and Additional Costs	\$20,688
	3.6 Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7 Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,941
	Total Indirect Cost (3)	<b>\$80,864</b>
	<b>Subtotal Project Cost (B=A+3) 2017 \$</b>	<b>\$425,697</b>
<b>4 Network Upgrade Facilities (NUF)</b>		
4.1 NUF proposed as element of the Project	\$0	
4.2 NUF identified during Evaluation	\$0	
	<b>Subtotal NUF Cost (C)</b>	<b>\$0</b>
	<b>Total Project Cost (B+C) 2017 \$</b>	<b>\$425,697</b>
	<b>Total Project Cost 2018 \$</b>	<b>\$438,468</b>

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**Segment B Proposals:**

**4.2.11. T019 NGRID/Transco Segment B**

<b>National Grid and NY Transco (T019)</b>				
		<b>Description</b>	<b>Total Amount (In thousand \$)</b>	
<b>Direct Cost</b>	<b>1</b>	<b>Transmission Lines</b>		
	1.1	Clearing & Access	\$34,641	
	1.2	Foundations	\$44,405	
	1.3	Structures	\$56,279	
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$30,070	
	1.5	Insulators, Fitting and Hardwares	\$11,200	
			Subtotal (1)	<b>\$176,595</b>
	<b>2</b>	<b>Substations</b>		
	2.1	Knickerbocker Substation	\$26,306	
	2.2	East Greenbush Substation	\$61	
	2.3	Schodack Substation	\$2,226	
	2.4	Churchtown Substation	\$14,616	
	2.5	Pleasant Valley Substation	\$6,939	
	2.6	Substation Interconnections	\$5,534	
			Subtotal (2)	<b>\$55,682</b>
		Total (1+2)	\$232,277	
		Contractors Mark-up (15% of Total 1+2)	\$34,842	
		Total Direct Cost (A)	<b>\$267,118</b>	
<b>Indirect Cost</b>	<b>3</b>	<b>Technical Services Costs</b>		
	3.1	Contractor Mobilization / Demobilization	\$2,323	
	3.2	Project Management, Material Handling & Amenities	\$16,172	
	3.3	Engineering	\$15,527	
	3.4	Testing & Commissioning	\$1,324	
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$16,982	
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,428	
		Total Indirect Cost (3)	<b>\$59,755</b>	
		<b>Subtotal Project Cost (B=A+3) 2017 \$</b>	<b>\$326,874</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
	4.1	NUF proposed as element of the Project (Fishkill and New Scotland Terminals)	\$1,085	
	4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000	
		Subtotal NUF Cost (C)	<b>\$31,085</b>	
		Total Project Cost (B+C) 2017 \$	<b>\$357,959</b>	
		Total Project Cost 2018 \$	<b>\$368,698</b>	

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4.2.12. T022 NextEra Segment B

<b>NextEra Energy (T022)</b>			
Description		Total Amount (In thousand \$)	
Direct Cost	1	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$33,783
	1.2	Foundations	\$17,271
	1.3	Structures	\$49,013
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$25,925
	1.5	Insulators, Fitting and Hardwares	\$9,609
	Subtotal (1)		<b>\$135,602</b>
	2	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$15,110
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$0
	2.4	Churchtown Substation	\$14,897
	2.5	Pleasant Valley Substation	\$2,798
	2.6	Substation Interconnections	\$6,769
	Subtotal (2)		<b>\$39,635</b>
Total (1+2)		\$175,237	
Contractors Mark-up (15% of Total 1+2)		\$26,286	
Total Direct Cost (A)		<b>\$201,523</b>	
Indirect Cost	3	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$1,752
	3.2	Project Management, Material Handling & Amenities	\$14,399
	3.3	Engineering	\$11,654
	3.4	Testing & Commissioning	\$920
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$10,365
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
Total Indirect Cost (3)		<b>\$46,718</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$248,241</b>	
4	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project	\$0	
4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000	
Subtotal NUF Cost (C)		<b>\$30,000</b>	
Total Project Cost (B+C) 2017 \$		<b>\$278,241</b>	
Total Project Cost 2018 \$		<b>\$286,588</b>	

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#### 4.2.13. T023 NextEra Segment B – Alt

<b>NextEra Energy (T023)</b>			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$34,215
	1.2	Foundations	\$21,257
	1.3	Structures	\$67,904
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$30,529
	1.5	Insulators, Fitting and Hardwares	\$11,349
	Subtotal (1)		<b>\$165,255</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$15,110
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$0
	2.4	Churchtown Substation	\$13,040
	2.5	Pleasant Valley Substation	\$2,798
	2.6	Substation Interconnections	\$6,473
	Subtotal (2)		<b>\$37,482</b>
Total (1+2)		\$202,736	
Contractors Mark-up (15% of Total 1+2)		\$30,410	
Total Direct Cost (A)		<b>\$233,147</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,027
	3.2	Project Management, Material Handling & Amenities	\$16,697
	3.3	Engineering	\$13,253
	3.4	Testing & Commissioning	\$874
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$12,954
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
Total Indirect Cost (3)		<b>\$53,433</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$286,580</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project	\$0	
4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000	
Subtotal NUF Cost (C)		<b>\$30,000</b>	
Total Project Cost (B+C) 2017 \$		<b>\$316,580</b>	
Total Project Cost 2018 \$		<b>\$326,077</b>	

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4.2.14. T029 NAT/NYPA Segment B Base

<b>NY Power Authority and North American Transmission (T029)</b>			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$34,313
	1.2	Foundations	\$17,769
	1.3	Structures	\$52,916
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$30,069
	1.5	Insulators, Fitting and Hardwares	\$11,442
	Subtotal (1)		<b>\$146,509</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$14,982
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$2,226
	2.4	Churchtown Substation	\$15,925
	2.5	Pleasant Valley Substation	\$2,798
	2.6	Substation Interconnections	\$5,495
	Subtotal (2)		<b>\$41,487</b>
Total (1+2)		\$187,996	
Contractors Mark-up (15% of Total 1+2)		\$28,199	
Total Direct Cost (A)		<b>\$216,196</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$1,880
	3.2	Project Management, Material Handling & Amenities	\$15,363
	3.3	Engineering	\$12,524
	3.4	Testing & Commissioning	\$973
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$14,136
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
	Total Indirect Cost (3)		<b>\$52,504</b>
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$268,700</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project (Middletown Line and Terminal)	\$16,261	
4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000	
Subtotal NUF Cost (C)		<b>\$46,261</b>	
Total Project Cost (B+C) 2017 \$		<b>\$314,961</b>	
Total Project Cost 2018 \$		<b>\$324,410</b>	

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4.2.15. T030 NAT/NYPA Segment B Enhanced

<b>NY Power Authority and North American Transmission (T030)</b>			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$34,378
	1.2	Foundations	\$18,131
	1.3	Structures	\$56,775
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$35,969
	1.5	Insulators, Fitting and Hardwares	\$11,553
	Subtotal (1)		<b>\$156,807</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$14,982
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$2,226
	2.4	Churchtown Substation	\$16,010
	2.5	Pleasant Valley Substation	\$2,778
	2.6	Substation Interconnections	\$6,312
Subtotal (2)		<b>\$42,369</b>	
Total (1+2)		\$199,176	
Contractors Mark-up (15% of Total 1+2)		\$29,876	
Total Direct Cost (A)		<b>\$229,052</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$1,992
	3.2	Project Management, Material Handling & Amenities	\$15,576
	3.3	Engineering	\$13,164
	3.4	Testing & Commissioning	\$972
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$14,389
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
	Total Indirect Cost (3)		<b>\$53,721</b>
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$282,773</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project (Middletown Line and Terminal)	\$16,261	
4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000	
Subtotal NUF Cost (C)		<b>\$46,261</b>	
Total Project Cost (B+C) 2017 \$		<b>\$329,034</b>	
Total Project Cost 2018 \$		<b>\$338,905</b>	

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4.2.16. T032 ITC Segment B

<b>ITC (T032)</b>			
<b>Description</b>		<b>Total Amount</b> (In thousand \$)	
<b>Direct Cost</b>	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$35,253
	1.2	Foundations	\$82,888
	1.3	Structures	\$67,205
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$33,769
	1.5	Insulators, Fitting and Hardwares	\$16,154
	<b>Subtotal (1)</b>		<b>\$235,269</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$21,112
	2.2	East Greenbush Substation	\$0
	2.3	Schodack Substation	\$0
	2.4	Churchtown Substation	\$1,977
	2.5	Pleasant Valley Substation	\$3,101
	2.6	Substation Interconnections	\$5,764
<b>Subtotal (2)</b>		<b>\$31,954</b>	
<b>Total (1+2)</b>		<b>\$267,224</b>	
Contractors Mark-up (15% of Total 1+2)		\$40,084	
<b>Total Direct Cost (A)</b>		<b>\$307,307</b>	
<b>Indirect Cost</b>	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,672
	3.2	Project Management, Material Handling & Amenities	\$18,202
	3.3	Engineering	\$16,986
	3.4	Testing & Commissioning	\$755
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$16,833
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
<b>Total Indirect Cost (3)</b>		<b>\$63,075</b>	
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$370,382</b>	
<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>		
4.1	NUF proposed as element of the Project	\$0	
4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000	
<b>Subtotal NUF Cost (C)</b>		<b>\$30,000</b>	
<b>Total Project Cost (B+C) 2017 \$</b>		<b>\$400,382</b>	
<b>Total Project Cost 2018 \$</b>		<b>\$412,394</b>	

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### 4.3. Risk

The review team completed an evaluation of the potential risks associated with the proposals and summarized the significant risks, including those that were previously identified by each Developer. The review team’s evaluation was based on the team’s collective experience with transmission line and substation projects in New York State.

The significant drivers to the project risks considered were:

- Article VII review approval process and potential environmental issues
- Procurement of major equipment
- Real Estate acquisition
- Construction

The most significant risks are summarized below. The review team also recommends that a Risk Management Program be implemented in the execution of the project or projects selected by the NYISO. A Risk Management Program will highlight items such as safety management, materials management, construction operations, outage planning, QA/QC program, field inspection, and environmental controls that are critical in identifying both risk areas and specific mitigation strategies. It is also important that Risk Management become a living project component that is constantly monitored and updated as the project progresses.

#### 4.3.1. Common Risks

The risks common to all proposals are summarized below. The costs for these risks are adequately covered by the project contingency.

**Common Risks to all Proposals**

#	Risk Title	Description	Comment
1	Article VII Certificate	Article VII review approval process could take longer than estimated in schedule for a variety of reasons ( <i>i.e.</i> , additional special studies requested by involved agencies, lack of stakeholder consensus).	Developer needs early outreach with all stakeholders and to prepare a comprehensive application. Developer’s experience with Article VII process will be essential.
2	Other environmental approvals	Federal agency and other approvals could take longer than the state Article VII process. This could become	Developer needs early outreach with Federal agencies and others to prepare comprehensive

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		more likely if cutbacks of funding to regulatory agencies affect employee staffing.	applications and obtain approvals in parallel with Article VII process.
3	Public Opposition	If local groups or citizens oppose the project, it could cause significant delays especially if opposition results in litigation.	Developer needs early outreach to solicit public involvement, incorporate public concerns during planning stage before project execution, build mitigation into design, and foster community buy-in.
4	EM&CP Approval	EM&CP approval process could take longer than estimated by the Developer in schedule.	Developer needs to prepare a comprehensive EM&CP that will meet regulatory agency requirements. Developer's experience with DPS, DEC, Ag. & Markets, and other agency requirements will be essential.
5	Environmental Study Findings	Environmental studies could find critical habitat, wetlands, agricultural lands, rare, threatened or endangered species, cultural or archeological sites, etc. that could require re-routing of lines or special conditions such as seasonal restriction on construction. The time of year when studies can be conducted could also affect project schedule. Access to structures in Black Creek Marsh may require design or construction modifications.	Studies need to be scheduled and conducted early in the process to ensure design and the EM&CP adequately minimizes, mitigates or avoids environmental impacts.
6	Unknown environmental conditions discovered	During construction, the Developer could encounter previously unidentified issues, such as contaminated soil, archeological	Environmental monitor will be on-site during construction. Such findings could require relocating

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	during construction	remains, rare, threatened or endangered species, unidentified utilities, etc.	and redesigning structures resulting in construction delays.
7	Violation of environmental requirements during construction	Construction activities could result in violations of environmental permits/approvals due to inadequate control measures or not following plans (i.e., storm water discharges) resulting in stop work notice.	The risk can be mitigated by following Best Management Practices and ensure crews are adequately trained to implement EM&CP and other environmental permit/approval requirements.
8	Gas pipeline mitigation	Transmission line crossings and paralleling of natural gas pipelines may require grounding or other mitigation, and natural gas pipeline entities are increasingly aware of this issue and demanding mitigation to be installed by transmission utilities.	The cost of gas pipeline mitigation studies and mitigation requirements are relatively small compared to the overall project cost. The risk can be mitigated by a study to determine the exact location of gas pipeline(s) and recommend mitigation requirements.
9	Transmission line crossings	<p>Crossing of other transmission and distribution lines:</p> <ul style="list-style-type: none"> <li>creates additional schedule risk, to the extent an outage needs to be scheduled;</li> <li>creates additional operating risk, to the extent a single event could remove both elements from services; and</li> <li>creates cost risk to the extent unexpected costs such as raising, lowering, or relocating an existing line is required.</li> </ul>	This risk is mitigated by early identification of all necessary crossings. For example, this risk is best minimized during construction through frequent coordination with the existing transmission line owner and installation of protective netting and other protection prior to pulling sock line and conductor. This risk can be mitigated through the development of High Risk Evolution Plans for transmission crossings, which include, at a minimum, coordination with all involved utility owners, contractors, construction and

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			project management planning sessions and a detailed schedule of events for crossing.
10	Highway, Rail Road & Navigable Waterway crossings	Crossing of Highways, Rail Roads, and Navigable Waterways creates additional risk to the project schedule and cost, depending on the requirements imposed during construction.	The risks can be mitigated by early identification of all necessary crossings. Prior to and during construction this risk is best minimized through frequent coordination with those responsible for the operation of the facilities being crossed. Develop High Risk Evolution Plans for all major highway, RR or waterway crossings which include at a minimum coordination with RR, flaggers, contractors, Local and state police / highway patrol, construction and project management planning sessions and a detailed schedule of events for crossing.
11	Material Shortages	Material and equipment shortages and delayed shipments.	The risks can be mitigated by proper quality assurance during engineering to insure adequate quantities ordered. Procurement with sufficient period of float between scheduled deliveries from suppliers and when material is needed for construction and proactive monitoring and expediting.
12	Operational Issues	Need to maintain resources for emergency response for the life of the facility.	This risk can be mitigated by maintaining a local staff, contracting with emergency restoration provider in the project

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			area, and entering into mutual assistance agreements with neighboring utilities.
13	Need for additional System Upgrade Facilities	Completion of the detailed studies, such as fault studies and protection coordination for the project, will normally be completed during the SIS, the Facilities Study and detailed engineering.	The system modifications proposed by the Developers may require replacement of breakers and protection equipment on the existing system. Additional thermal overloads may be identified.
14	Catastrophic HSE / Safety Event	High voltage transmission and substation work is inherently dangerous. Accidents that occur on projects of this nature frequently result in serious injury or fatality. Catastrophic safety events such as loss of life can result in extended work stoppages across all stages of the project.	This risk can be mitigated through a robust Project and Site Safety Program implementation. Project Orientations which verify training of ALL project personnel. Extensive Health, Safety and Environmental (HSE) management presence during construction to ensure compliance.
15	Construction Quality Control	Compliance with project specifications and quality can be compromised if installations are not properly monitored. Structure misalignments, improper structure framing, use of incorrect materials, etc. can result in re-work, unnecessary delays and project overruns. Larger and complex projects that require greater resources are more susceptible to Quality Control Issues. If the NYPSC cited a contractor as being in non-compliance, the result can be extended work stoppages.	This risk can be mitigated by detailed Quality Control/Quality Assurance Plans during early planning stages and in a detailed Project Execution Plan; ensuring inspection processes are in place for all components of construction; and considering the utilization of third-party inspectors to ensure compliance.

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16	Change Order Management - Construction Impacts	Unresolved Change Orders may result in delays to construction and impact the schedule.	This risk can be mitigated by including detailed Change Order Management Plan and process in the Project Execution Plan in order to mitigate potential delays.
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#### 4.3.2. Project-Specific Risks

Summarized below are the review team’s most significant risk findings specific to each proposal. This is not all inclusive but is intended to highlight those items that pose the most critical risks to the completion of the projects.

##### 4.3.2.1. SEGMENT A:

T018 – New York Energy Solution Segment A - National Grid/Transco			
#	Risk Title	Description	Comment
1	Design Concern - New Scotland Substation (National Grid Owned)	A significant issue is the lack of space in Control House #3 i.e., the most up-to-date building of the three existing control houses.	To keep the new 345 kV panels with the existing panel line up will likely require expanding the building to the east where the cable trench entrances and a communication tower is located. <i>(While the Developer did not include expanding the control house in its estimate, the review team’s independent cost estimate includes this scope of work.)</i>
2	Obtaining Site Control and Property Acquisition	National Grid owns all property required for new facilities.  <i>De minimis</i> property may need to be acquired for access and construction marshalling yards.	National Grid’s control of the property obviates any significant issue. Property will ultimately be transferred to the NY Transco.

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3	Design Concern - EMF	The existing corridor between Princetown Junction and New Scotland Substation (345 kV lines #14 and #18, and 115 kV Line #13 are located in that corridor) is currently estimated to exceed NPSC guidelines for EMF levels. The proposed design improves the condition, but EMF levels are still estimated to exceed the guidelines.	EMF levels will have to be addressed during detailed engineering and may result in purchasing EMF easements from property owners along the ROW between Princetown and New Scotland. <i>(The review team's independent cost estimate includes the cost for additional EMF easements.)</i> This is considered a critical risk for all Segment A proposals.
4	Re-use of existing structures	During construction the Developer could discover that structures originally planned for re-use are in worse condition than expected or inadequate and require repair or replacement.	The Developer proposes re-using 92 structures on the double circuit Edic/Fraser and 230 kV line # 30 beginning at Edic/Porter and continuing east for 12.6 miles. A cursory visual inspection indicate the structures are in good physical condition. Thorough inspection and analysis of existing structures is advisable prior to completing final design.

**T021 – Enterprise Line: Segment A – NextEra**

#	Risk Title	Description	Comment
1	Design Concern - New Scotland Substation (National Grid Owned)	A significant issue is the lack of space in Control House #3-i.e., the most up-to-date building of the three existing control houses.	To keep the new 345 kV panels with the existing panel line up will likely require expanding the building to the east where the cable trench entrances and a communication tower is located. <i>(While the Developer did not include expanding the control house in its estimate, the review</i>

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			<i>team's independent cost estimate includes this scope of work.)</i>
2	Obtaining Site Control and Property Acquisition	<p>Proposal utilizes existing ROW owned by National Grid.</p> <p><i>De minimis</i> property may need to be acquired for access and construction marshalling yards.</p> <p>Additionally, Developer must procure property for Princetown substation.</p>	<p>Negotiations with the incumbent utility could result in potential cost and schedule implications.</p> <p>The review team's schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.</p> <p>For Princetown Substation, Developer has already obtained a purchase option on property for its proposed location.</p>
3	Construction Concern – Use of Concrete Poles	<p>Developer proposes using concrete poles for the majority of transmission line structures and has considered some of the concerns associated with transportation, public protection and community impact.</p>	<p>Developer needs to evaluate each proposed structure location during detailed engineering to verify delivery and installation feasibility, and develop a robust risk mitigation plan taking account of the project risks, planning and clear mitigation for problem areas. Issues encountered with delivery or installation of these poles may result in schedule delays and increased costs.</p>

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4	Design Concern - EMF	<p>The existing corridor between Princetown Junction and New Scotland Substation (345 kV lines #14 and #18, and 115 kV Line #13 are located in that corridor) is currently estimated to exceed NPSC guidelines for EMF levels. The proposed design improves the condition, but EMF levels are still estimated to exceed the guidelines.</p>	<p>EMF levels will have to be addressed during detailed engineering and may result in purchasing EMF easements from property owners along the right-of-way between Princetown and New Scotland. <i>(The review team's independent cost estimate includes the cost for additional EMF easements.)</i></p> <p>This is considered a critical risk for all Segment A proposals.</p>
5	Re-use of existing structures	<p>During construction, the Developer could discover that structures originally planned for re-use are in worse condition than expected or inadequate and require repair or replacement.</p>	<p>The Developer proposes re-using 92 structures on the double circuit Edic/Fraser and 230 kV line #30 beginning at Edic/Porter and continuing east for 12.6 miles. A cursory visual inspection indicates the structures are in good physical condition. Thorough inspection and analysis of existing structures is advisable prior to completing final design.</p>

T025 – Segment A + 765 kV Proposal - North American Transmission/NYPA			
#	Risk Title	Description	Comment

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1	Design Concern - Rotterdam Substation (National Grid Owned)	Proposed substation layout is directly over two existing gas transmission lines and is likely to be resisted by the owner of that facility.	Relocation of the existing gas transmission lines is likely necessary and the review team's analysis indicates that the lines could be relocated within the National Grid property. There is a risk that the new substation may need to be moved to an alternate location within the existing National Grid property or <i>de minimis</i> additional easement be acquired. See section 4.11.1.4 for more detail. <i>(The review team's independent cost estimate includes the cost for relocating these gas transmission lines.)</i>
2	Property Acquisition Concern - Princetown Substation	NAT/NYPA's proposed design for Princetown Substation appears to just fit within the existing National Grid ROW.	If the final design requires purchasing additional property it will likely be difficult and increase cost. <i>(The review team's independent cost estimate does not include the cost for additional property/easements.)</i> This is considered one of the highest risks for this proposal
3	Design Concern – Princetown Substation location (on National Grid Owned ROW)	Proposed substation is located close to existing homes and buildings. These property owners may oppose the siting of a substation near their property due to concerns with visual impact, noise, security lights, etc.	Public opposition to this site may result in delays associated with obtaining regulatory approvals and increased costs. The risks include: 1. the potential need for an alternative design such as GIS

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		Construction on ROW with existing lines will require coordination with incumbent utility to maintain clearances.	or alternative site may need to be identified, such as a location midway between the Junction and Rotterdam which has adequate space and would not be as close to existing buildings or roads; and 2. short term outages and/or temporary bypasses of existing lines may be required during construction.
4	Design Concern - Marcy 765 kV Substation (NYPA Owned)	As proposed, the Developer's layout has a single span of conductors crossing the bus between the new 765 kV breaker and the south main bus, and between the new breaker and breaker 7202.	A dropped conductor could trip out the south main bus as well as the bus between the new breaker and breaker 7202.
5	Design Concern - New Scotland Substation (National Grid Owned)	A significant issue is the lack of space in Control House #3—i.e., the most up-to-date building of the three existing control houses.	To keep the new 345 kV panels with the existing panel line up will likely require expanding the building to the east where the cable trench entrances and a communication tower are located. <i>(While the Developer did not include expanding the control house in its estimate, the review team's independent cost estimate includes this scope of work.)</i>
6	Obtaining Site Control and Property Acquisition	Proposal utilizes existing ROW owned by National Grid.	Negotiations with the incumbent utility could result in potential cost and schedule implications.

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		<i>De minimis</i> property may need to be acquired for access and construction marshalling yards.	The review team’s schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.
7	Design Concern - EMF	The existing corridor between Princetown Junction and New Scotland Substation(345 kV lines #14 and #18, and 115 kV Line #13 are located in that corridor) is currently estimated to exceed NYS PSC guidelines for EMF levels. Additionally, conversion of the 345 kV line between Marcy substation and proposed Knickerbocker substation to 765 kV is estimated to likely increase EMF levels beyond NYPSC guidelines.	EMF levels will have to be addressed during detailed engineering and may result in purchasing EMF easements totaling approximately 76 acres from property owners along the ROW between Marcy and New Scotland. <i>(The review team’s independent cost estimate includes the cost for additional EMF easements.)</i> This is considered a critical risk for all Segment A proposals.
8	Public Opposition - 765 kV Transmission Line	New York State’s only 765 kV transmission line between Massena and Marcy was completed in 1975 amidst heavy public opposition. As such, it is highly likely that converting the 345 kV line between Marcy substation and the proposed Knickerbocker substation will be controversial due to increased	This risk could be mitigated with a targeted and well-planned public outreach effort. However, negative public opposition may result in delays associated with the project’s schedule and affect the project’s cost and the ability to obtain required EMF easements.

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		EMF, noise from corona and increased structure heights, and result in delays associated with obtaining regulatory approvals and EMF easements likely based on public opposition. New structures in the 2.5 mile section of 765 kV line range in height from 130 to 165 feet. In the section of the line where there is the existing 115 kV transmission line, the four new structures will be approximately 80 feet taller than the existing structures.	
9	Design Concern - 765 kV Transmission Line	The 345 kV line between Marcy substation and the proposed Knickerbocker substation was designed and constructed to 765 kV standards over 40 years ago.	Design clearances will have to be verified against current standards during detailed design. Also, the condition of insulators and hardware will have to be evaluated due to age. Changing out hardware due to age or modifications to reduce corona could have significant cost and schedule implications. <i>(The review team's independent cost estimate includes an allowance for potential remedial work that may be identified.)</i>
10	Re-use of existing structures	During construction the Developer could discover that structures originally planned for re-use are in worse condition than expected or inadequate and require repair or replacement.	The Developer proposes re-using 92 structures on the double circuit Edic/Fraser and 230 kV line #30 beginning at Edic/Porter and continuing east for 12.6 miles. A cursory visual

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			inspection indicate the structures are in good physical condition. Thorough inspection and analysis of existing structures is advisable prior to completing final design.
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**T026 – Segment A Base Proposal - North American Transmission/NYPA**

#	Risk Title	Description	Comment
1	Design Concern - Rotterdam Substation (National Grid Owned)	Proposed substation layout is directly over two existing gas transmission lines and is likely to be resisted by the owner of that facility.	Relocation of the existing gas transmission lines is likely necessary, and the review team’s analysis indicates that the lines could be relocated within the National Grid property. There is a risk that the new substation may need to be moved to an alternate location within the existing National Grid property or <i>de minimis</i> additional easement be acquired. See section 4.11.1.4 for more detail. <i>(The review team’s independent cost estimate includes the cost for relocating these gas transmission lines.)</i>
2	Design Concern - New Scotland Substation (National Grid Owned)	A significant issue is the lack of space in Control House #3 i.e., the most up-to-date building of the three existing control houses.	To keep the new 345 kV panels with the existing panel line up will likely require expanding the building to the east where the cable trench entrances and a communication tower are located. <i>(While the Developer</i>

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			<i>did not include expanding the control house in its estimate, the review team's independent cost estimate includes this scope of work.)</i>
3	Obtaining Site Control and Property Acquisition	<p>Proposal utilizes existing ROW owned by National Grid.</p> <p><i>De minimis</i> property may need to be acquired for access and construction marshalling yards.</p>	<p>Negotiations with the incumbent utility could result in potential cost and schedule implications.</p> <p>The review team's schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimated contingency should be sufficient to cover potential increased costs which is considered a low probability.</p>
4	Design Concern - EMF	<p>The existing corridor (345 kV Lines #14 and #18, and 115 kV line #13) between Princetown Junction and New Scotland Substation is currently estimated to exceed NYS PSC guidelines for EMF levels. The proposed design improves the condition, but EMF levels are still estimated to exceed the guidelines.</p>	<p>EMF levels will have to be addressed during detailed engineering and may result in purchasing EMF easements from property owners along the right-of-way between Princetown and New Scotland. <i>(The review team's independent cost estimate includes the cost for additional EMF easements.)</i> This is considered a critical risk for all Segment A proposals.</p>

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5	Re-use of existing structures	During construction the Developer could discover that structures originally planned for re-use are in worse condition than expected or inadequate and require repair or replacement.	The Developer proposes re-using 92 structures on the double circuit Edic/Fraser and 230 kV Line 30 beginning at Edic/Porter and continuing east for 12.6 miles. A cursory visual inspection indicate the structures are in good physical condition. Thorough inspection and analysis of existing structures is advisable prior to completing final design.
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<b>T027 – Segment A Double Circuit Proposal - North American Transmission/NYPA</b>			
#	Risk Title	Description	Comment
1	Design Concern - Rotterdam Substation (National Grid Owned)	Proposed substation layout is directly over two existing gas transmission lines and is likely to be resisted by the owner of that facility.	Relocation of the existing gas transmission lines is likely necessary, and the review team’s analysis indicates that the lines could be relocated within the National Grid property. There is a risk that the substation may need to be moved to an alternate location within the existing National Grid property or <i>de minimis</i> additional easement be acquired. See section 4.11.1.4 for more detail. <i>(The review team’s independent cost estimate includes the cost for relocating these gas transmission lines.)</i>

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2	Property Acquisition Concern - Princetown Substation	NAT/NYPA's proposed design for Princetown Substation appears to just fit within the existing National Grid ROW.	If required by the final design purchasing additional property will likely be difficult and increase cost. <i>(The review team's independent cost estimate does not include the cost for additional property/easements.)</i>
3	Design Concern – Princetown Substation location (on National Grid Owned ROW)	<p>Proposed GIS substation is located close to existing homes and buildings. These property owners may oppose the siting of a substation near their property due to concerns with visual impact, noise, security lights, etc.</p> <p>Construction on ROW with existing lines will require coordination with incumbent utility to maintain clearances.</p>	<p>Public opposition to this site may result in delays associated with obtaining regulatory approvals and increased costs. An alternative site may need to be identified such as a location midway between the Junction and Rotterdam which has adequate space and would not be as close to existing buildings or roads, minimizing the visual impact and possible opposition.</p> <p>The risk for this proposal is somewhat minimized by the proposed GIS design which has a smaller footprint and less visual impact. Short term outages and/or temporary bypasses of existing lines may be required during construction.</p>
4	Design Concern - New Scotland Substation (National Grid Owned)	A significant issue is the lack of space in Control House #3—i.e., the most up-to-date building of the three existing control houses.	To keep the new 345 kV panels with the existing panel line up will likely require expanding the building to the east where the cable trench entrances and a communication tower are

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			located. <i>(While the Developer did not include expanding the control house in its estimate, the review team's independent cost estimate includes this scope of work.)</i>
5	Obtaining Site Control and Property Acquisition	<p>Proposal utilizes existing ROW owned by National Grid.</p> <p><i>De minimis</i> property may need to be acquired for access and construction marshalling yards.</p>	<p>Negotiations with the incumbent utility could result in potential cost and schedule implications.</p> <p>The review team's schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.</p>
6	Design Concern - EMF	<p>The existing corridor (345 kV Lines #14 and #18, and 115 kV line #13) between Princetown Junction and New Scotland Substation is currently estimated to exceed NYS PSC guidelines for EMF levels. The proposed design improves the condition, but EMF levels are still estimated to exceed the guidelines.</p>	<p>EMF levels will have to be confirmed during detailed engineering. There is a risk that the EMF levels will exceed NYS PSC levels after final studies and may result in purchasing EMF easements from property owners along the right-of-way between Princetown and New Scotland. (The review team's independent cost estimate includes the cost for additional EMF easements.)</p>

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			This is considered a critical risk for all Segment A proposals.
7	Re-use of existing structures	During construction the Developer could discover that structures originally planned for re-use are in worse condition than expected or inadequate and require repair or replacement.	The Developer proposes re-using 92 structures on the double circuit Edic/Fraser and 230 kV line #30 beginning at Edic/Porter and continuing east for 12.6 miles. A cursory visual inspection indicate the structures are in good physical condition. Thorough inspection and analysis of existing structures is advisable prior to completing final design.

<b>T028 – Segment A Enhanced Proposal - North American Transmission/NYPA</b>			
#	Risk Title	Description	Comment
1	Design Concern - Rotterdam Substation (National Grid Owned)	Proposed substation layout is directly over two existing gas transmission lines and is likely to be resisted by the owner of that facility.	Relocation of the existing gas transmission lines is likely, and the review team’s analysis indicates that the lines could be relocated within the National Grid property. There is a risk that the substation may need to be moved to an alternate location within the existing National Grid property or <i>de minimis</i> additional easement be acquired. See section 4.11.1.4 for more detail. <i>(The review team’s independent cost estimate includes the cost for</i>

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			<i>relocating these gas transmission lines.)</i>
2	Property Acquisition Concern - Princetown Substation	NAT/NYPA's proposed design for Princetown Substation appears to just fit within the existing National Grid rights-of-way.	If required by the final design purchasing additional property will likely be difficult and increase cost. <i>(The review team's independent cost estimate does not include the cost for additional property/easements.)</i>
3	Design Concern – Princetown Substation location (on National Grid Owned ROW)	Proposed substation is located close to existing homes and buildings. These property owners may oppose the siting of a substation near their property due to concerns with visual impact, noise, security lights, etc.  Construction on ROW with existing lines will require coordination with incumbent utility to maintain clearances.	Public opposition to this site may result in delays associated with obtaining regulatory approvals and increased costs. An alternative design such as GIS or an alternative site may need to be identified such as a location midway between the Junction and Rotterdam, which has adequate space and would not be as close to existing buildings or roads minimizing the visual impact and possible opposition.  Short term outages and/or temporary bypasses of existing lines may be required during construction.
4	Design Concern - New Scotland Substation (National Grid Owned)	A significant issue is the lack of space in Control House #3, the most up-to-date building of the three existing control houses.	To keep the new 345 kV panels with the existing panel line up will likely require expanding the building to the east where the cable trench entrances and a communication tower are located. <i>(While the Developer</i>

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			<i>did not include expanding the control house in its estimate, the review team's independent cost estimate will include this scope of work.)</i>
5	Obtaining Site Control and Property Acquisition	<p>Proposal utilizes existing ROW owned by National Grid.</p> <p><i>De minimis</i> property may need to be acquired for access and construction marshalling yards.</p>	<p>Negotiations with the incumbent utility could result in potential cost and schedule implications.</p> <p>The review team's schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.</p>
6	Design Concern - EMF	<p>The existing corridor (which has 345 kV lines #14 and #18, and 115 kV line #13) between Princetown Junction and New Scotland Substation is currently estimated to exceed NYS PSC guidelines for EMF levels. The proposed design improves the condition, but EMF levels are still estimated to exceed the guidelines.</p>	<p>EMF levels will have to be addressed during detailed engineering and may result in purchasing EMF easements from property owners along the right-of-way between Princetown and New Scotland. <i>(The review team's independent cost estimate includes the cost for additional EMF easements.)</i></p> <p>This is considered a critical risk for all Segment A proposals.</p>

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7	Re-use of existing structures	During construction the Developer could discover that structures originally planned for re-use are in worse condition than expected or inadequate and require repair or replacement.	The Developer proposes re-using 92 structures on the double circuit Edic/Fraser and 230 kV line #30 beginning at Edic/Porter and continuing east for 12.6 miles. A cursory visual inspection indicate the structures are in good physical condition. Thorough inspection and analysis of existing structures is advisable prior to completing final design.
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T031 – 16NYPP1-1A AC Transmission – ITC			
#	Risk Title	Description	Comment
1	Reliability Concern - New Scotland Substation (National Grid Owned)	ITC proposes connecting a new 345 kV transmission line into New Scotland by adding a 345 kV terminal structure, circuit breaker with disconnect switches connected to the main bus.	While this may be the simplest arrangement, it also provides the least amount of reliability. With this configuration, a failed breaker or a bus fault will cause a loss of the following: New 345 kV line to Princetown 345 kV Line to Princetown (formally line14 to Edic), 345 kV Line 93 to Leeds, 345 kV Line 2 to Alps, Bank #2, Capacitor Banks #1 and #3. The review team recognizes that a failed breaker on any of the existing lines, capacitor banks or Bank #2 will also cause a similar loss to those stated. However, the

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			proposed arrangement does not improve the reliability and will exacerbate the situation.
2	Design Concern - New Scotland Substation (National Grid Owned)	A significant issue is the lack of space in Control House #3, the most up-to-date building of the three existing control houses.	To keep the new 345 kV panels with the existing panel line up will likely require expanding the building to the east where the cable trench entrances and a communication tower are located. <i>(While the Developer did not include expanding the control house in its estimate, the review team's independent cost estimate includes this scope of work.)</i>
3	Design Concern - Rotterdam Substation (National Grid Owned)	Proposed substation layout is directly over an existing gas transmission line and is likely to be resisted by the owner of that facility.	Relocation of the existing gas transmission line is likely, and the review team's analysis indicates that the lines could be relocated within the National Grid property. There is a risk that the substation location may need to be moved within the existing National Grid property or <i>de minimis</i> additional easement be acquired. See section 4.11.1.4 for more detail. <i>(The review team's independent cost estimate includes the cost for relocating this gas transmission line.)</i>
4	Reliability Concern - Rotterdam	ITC proposes a straight bus arrangement by installing two new 345 kV T-line terminals with	With this configuration, and because the 230 kV lines #30 and #31 are eliminated, a

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	Substation (National Grid Owned)	circuit breakers, disconnect switches, a 345 kV tie breaker, and two 345 kV – 230 kV transformers. Each transformer will have a 230 kV circuit breaker connected to the 230 kV main bus.	failed 230 kV breaker or a 230 kV bus fault will cause a loss of the entire 230 kV yard.
5	Property Acquisition Concern - Princetown Substation	ITC's proposed design for Princetown Substation will not fit within the existing National Grid ROW.	Purchasing additional property will likely be difficult and increase the cost of the project. <i>(The review team's independent cost estimate includes the cost for additional property/easements.)</i>
6	Design Concern – Princetown Substation location (on National Grid Owned ROW)	Proposed substation is located close to existing homes and buildings. These property owners may oppose the siting of a substation near their property due to concerns with visual impact, noise, security lights, etc.  Construction on ROW with existing lines will require coordination with incumbent utility to maintain clearances.	Public opposition to this site may result in delays associated with obtaining regulatory approvals and increased costs. An alternative design such as GIS or alternative site may need to be identified, such as a location midway between the Junction and Rotterdam which has adequate space and would not be as close to existing buildings or roads  Short term outages and/or temporary bypasses of existing lines will be required during construction.
7	Obtaining Site Control and Property Acquisition	Proposal utilizes existing ROW owned by National Grid.	Negotiations with the incumbent utility could result in potential cost and schedule implications.

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		<i>De minimis</i> property may need to be acquired for access and construction marshalling yards.	The review team's schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.
8	Design Concern - EMF	The Developer's calculations for EMF are currently estimated to exceed NYPSC guidelines for entire section.	EMF calculations will need to be confirmed during detail engineering. It is possible that EMF easements will need to be purchased for the entire ROW between Edic and New Scotland. At a minimum, easements will likely be required between Princetown and New Scotland. <i>(The review team's independent cost estimate includes the cost for additional EMF easements.)</i> This is considered a critical risk for all Segment A proposals.
9	Re-use of existing structures	During construction the Developer could discover that structures originally planned for re-use are in worse condition than expected or inadequate and require repair or replacement.	The Developer proposes re-using 92 structures on the double circuit Edic/Fraser and 230 kV line #30 beginning at Edic/Porter and continuing east for 12.6 miles. A cursory visual inspection indicate the structures are in good physical condition. Thorough inspection

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			and analysis of existing structures is advisable prior to completing final design.
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**SEGMENT B**

T019 – New York Energy Solution Segment B - National Grid/Transco			
#	Risk Title	Description	Comment
1	FAA requirements	Additional requirements may be required to accommodate air traffic.	Green Acres Airport is located about 700 feet east of the proposed ROW. The risks are mitigated by early and frequent coordination with the FAA and the local airport.
2	Design Concern - Pleasant Valley Substation (Con Ed Owned)	The Developer proposes terminating the new 345 kV line from Knickerbocker Substation in Bay #2 of Pleasant Valley Substation, which could require Network Upgrade Facilities to expand the Pleasant Valley Substation depending on the outcome of the NYISO's 2017 Class Year Study.	This will likely require adding two 345 kV breakers with disconnect switches to Bay #1. The Cricket Valley line will be moved from Bay #2 to Bay #1. Bay #2 will then be available for the new line from Knickerbocker. Depending on the outcome of the 2017 Class Year Study, the substation yard may have to be expanded to the southwest to accommodate one of the proposed 345 kV capacitor banks. <i>(This additional work is not included in the independent estimates.)</i>
3	Design Concern - Pleasant Valley Substation (Con Ed Owned)	Lack of space for additional panels in the control house.	The control house will need to be expanded to accommodate the additional panels. This is more apparent with the additional line for the Cricket Valley Project. <i>(Expansion of the control house is included in the independent estimates.)</i>

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4	Construction Concern - Churchtown Substation (NYSEG Owned)	Developer proposes constructing a new 115 kV, three-bay, breaker-and-a-half substation on the same property currently occupied by NYSEG's Churchtown Substation, eventually demolishing the entire existing substation.	The existing Churchtown substation feeds a radial 115 kV line to NYSEG's Craryville and Klinekill Substations. Construction sequencing will have to be developed to maintain service to this line during construction of the new Churchtown substation.
5	Visual Concern – Proposed Transmission Lines	Potential of public opposition due to visual impact. NYPSC has encouraged that new structures have minimal increase in height.	Need to address during detail engineering. The Developer's proposal has the same number of structures as the existing line but 48% of them have an increase in height between 5 ft. and 20 ft. and 5% have a height increase of more than 20 ft. This increases the siting risk of this proposal.
6	Obtaining Site Control and Property Acquisition	National Grid owns all property required for new facilities.  <i>De minimis</i> property may need to be acquired for access and construction marshalling yards.	National Grid's control of the property obviates any significant issue. Property will ultimately be transferred to the NY Transco.

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T022 – Enterprise Line: Segment B – NextEra			
#	Risk Title	Description	Comment
1	FAA requirements	Additional requirements may be required to accommodate air traffic.	Green Acres Airport is located about 700 feet east of the proposed ROW. The risks are mitigated by early and frequent coordination with the FAA and the local airport.
2	Construction Concern – Use of Concrete Poles	Developer proposes using concrete poles for the majority of transmission line structures and has considered some of the concerns associated with transportation, public protection and community impact.	Developer needs to evaluate each proposed structure location during detailed engineering to verify delivery and installation feasibility, and develop a robust risk mitigation plan taking account of the project risks, planning and clear mitigation for problem areas.
3	Design Concern - Pleasant Valley Substation (Con Ed Owned)	The Developer proposes terminating the new 345 kV line from Knickerbocker Substation in Bay #2 of Pleasant Valley Substation, which could require Network Upgrade Facilities to expand the Pleasant Valley Substation depending on the outcome of the NYISO's 2017 Class Year Study.	This will likely require adding two 345 kV breakers with disconnect switches to Bay #1. The Cricket Valley line will be moved from Bay #2 to Bay #1. Bay #2 will then be available for the new line from Knickerbocker. <i>(This additional work is not included in the independent estimates.)</i>
4	Design Concern - Pleasant Valley Substation (Con Ed Owned)	Lack of space for additional panels in the control house.	The control house will need to be expanded to accommodate the additional panels. This is more apparent with the additional line for the Cricket

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			Valley Project. ( <i>Expansion of the control house is included in the independent estimates.</i> )
5	Construction Concern - Churchtown Substation (NYSEG Owned)	Developer proposes constructing a new 115 kV, two-bay, breaker-and-a-half substation north of NYSEG's Churchtown Substation. NYSEG's substation will remain in service upon completion of the AC Transmission Project.	Additional property may be required to accommodate storm water management system.
6	Visual Concern – Proposed Transmission Lines	Potential of public opposition due to visual impact. NYPSC has encouraged that new structures have minimal increase in height.	Need to address during detail engineering. The Developer's proposal has the same number of structures as the existing line but 73% of them have an increase in height between 5 ft. and 20 ft. This increases the siting risk of this proposal.
7	Obtaining Site Control and Property Acquisition	Proposal utilizes existing ROW owned by National Grid.  <i>De minimis</i> property may need to be acquired for access and construction marshalling yards.	Negotiations with the incumbent utility could result in potential cost and schedule implications.  The review team's schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.

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T023 – Enterprise Line: Segment B Alt. – NextEra			
#	Risk Title	Description	Comment
1	FAA requirements	Additional requirements may be required to accommodate air traffic	Green Acres Airport is located about 700 feet east of the proposed ROW. The risks are mitigated by early and frequent coordination with the FAA and the local airport.
2	Construction Concern – Use of Concrete Poles	Developer proposes using concrete poles for the majority of transmission line structures and has considered some of the concerns associated with transportation, public protection and community impact.	Developer needs to evaluate each proposed structure location during detailed engineering to verify delivery and installation feasibility, and develop a robust risk mitigation plan taking account of the project risks, planning and clear mitigation for problem areas.
3	Design Concern - Pleasant Valley Substation (Con Ed Owned)	The Developer proposes terminating the new 345 kV line from Knickerbocker Substation in Bay #2 of Pleasant Valley Substation, which could require Network Upgrade Facilities to expand the Pleasant Valley Substation depending on the outcome of the NYISO's 2017 Class Year Study.	This will likely require adding two 345 kV breakers with disconnect switches to Bay #1. The Cricket Valley line will be moved from Bay #2 to Bay #1. Bay #2 will then be available for the new line from Knickerbocker. <i>(This additional work is not included in the independent estimates.)</i>
4	Design Concern - Pleasant Valley Substation (Con Ed Owned)	Lack of space for additional panels in the control house.	The control house will need to be expanded to accommodate the additional panels. This is more apparent with the additional line for the Cricket Valley Project.

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			<i>(Expansion of the control house is included in the independent estimates.)</i>
5	Construction Concern - Churchtown Substation (NYSEG Owned)	Developer proposes constructing a new 115 kV, two-bay, breaker-and-a-half substation north of NYSEG's Churchtown Substation. NYSEG's substation will remain in service upon completion of the AC Transmission Project.	Additional property may be required to accommodate storm water management system.
6	Visual Concern – Proposed Transmission Lines	Potential of public opposition due to visual impact. NYS PSC has encouraged that new structures have minimal increase in height.	Need to address during detail engineering. The Developer’s proposal has the same number of structures as the existing line but 83% of them have an increase in height between 5-ft. and 20-ft. This increases the siting risk of this proposal.
7	Obtaining Site Control and Property Acquisition	Proposal utilizes existing ROW owned by National Grid.  <i>De minimis</i> property may need to be acquired for access and construction marshalling yards.	Negotiations with the incumbent utility could result in potential cost and schedule implications.  The review team’s schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.

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T029 – Segment B Base Proposal - North American Transmission/NYPA			
#	Risk Title	Description	Comment
1	FAA requirements	Additional requirements may be required to accommodate air traffic	Green Acres Airport is located about 700 feet east of the proposed ROW. The risks are mitigated by early and frequent coordination with the FAA and the local airport.
2	Design Concern - Pleasant Valley Substation (Con Ed Owned)	The Developer proposes terminating the new 345 kV line from Knickerbocker Substation in Bay #2 of Pleasant Valley Substation, which could require Network Upgrade Facilities to expand the Pleasant Valley Substation depending on the outcome of the NYISO's 2017 Class Year Study.	This will likely require adding two 345 kV breakers with disconnect switches to Bay #1. The Cricket Valley line will be moved from Bay #2 to Bay #1. Bay #2 will then be available for the new line from Knickerbocker. <i>(This additional work is not included in the independent estimates.)</i>
3	Design Concern - Pleasant Valley Substation (Con Ed Owned)	Lack of space for additional panels in the control house.	The control house will need to be expanded to accommodate the additional panels. This is more apparent with the additional line for the Cricket Valley Project. <i>(Expansion of the control house is included in the independent estimates.)</i>
4	Visual Concern – Proposed Transmission Lines	Potential of public opposition due to visual impact. NYS PSC has encouraged that new structures have minimal increase in height.	Need to address during detail engineering. The Developer's proposal has the same number of structures as the existing line but 14% of them have an increase in height between 5-ft. and 20-ft. This increases the siting risk of this proposal.

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5	Obtaining Site Control and Property Acquisition	<p>Proposal utilizes existing ROW owned by National Grid.</p> <p><i>De minimis</i> property may need to be acquired for access and construction marshalling yards.</p>	<p>Negotiations with the incumbent utility could result in potential cost and schedule implications.</p> <p>The review team’s schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.</p>
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<b>T030 – Segment B Enhanced Base Proposal - North American Transmission/NYPA</b>			
#	Risk Title	Description	Comment
1	FAA requirements	Additional requirements may be required to accommodate air traffic	Green Acres Airport is located about 700 feet east of the proposed ROW. The risks are mitigated by early and frequent coordination with the FAA and the local airport.
2	Design Concern - Pleasant Valley Substation (Con Ed Owned)	The Developer proposes terminating the new 345 kV line from Knickerbocker Substation in Bay #2 of Pleasant Valley Substation, which could require Network Upgrade Facilities to expand the Pleasant Valley Substation depending on the outcome of the NYISO's 2017 Class Year Study.	This will likely require adding two 345 kV breakers with disconnect switches to Bay #1. The Cricket Valley line will be moved from Bay #2 to Bay #1. Bay #2 will then be available for the new line from Knickerbocker. <i>(This additional work is not included in the independent estimates.)</i>
3	Design Concern - Pleasant Valley Substation (Con Ed Owned)	Lack of space for additional panels in the control house.	The control house will need to be expanded to accommodate the additional panels. This is more apparent with the additional line for the Cricket Valley Project. <i>(Expansion of the control house is included in the independent estimates.)</i>
4	Visual Concern – Proposed Transmission Lines	Potential of public opposition due to visual impact. NYS PSC has encouraged that new structures have minimal increase in height.	Need to address during detail engineering. The Developer's proposal has the same number of structures as the existing line but 14% of them have an increase in height between 5-ft. and 20-ft. This

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			increases the siting risk of this proposal.
5	Obtaining Site Control and Property Acquisition	<p>Proposal utilizes existing ROW owned by National Grid.</p> <p><i>De minimis</i> property may need to be acquired for access and construction marshalling yards.</p>	<p>Negotiations with the incumbent utility could result in potential cost and schedule implications.</p> <p>The review team's schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.</p>

T032 – 16NYPP1-1B AC Transmission - ITC			
#	Risk Title	Description	Comment
1	FAA requirements	Additional requirements may be required to accommodate air traffic	Green Acres Airport is located about 700 feet east of the proposed ROW. The risks are mitigated by early and frequent coordination with the FAA and the local airport.
2	Design Concern - Pleasant Valley Substation (Con Ed Owned)	The Developer proposes terminating the new 345 kV line from Knickerbocker Substation in Bay #2 of Pleasant Valley Substation, which could require Network Upgrade Facilities to	This will likely require adding two 345 kV breakers with disconnect switches to Bay #1. The Cricket Valley line will be moved from Bay #2 to Bay #1. Bay #2 will then be available

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		expand the Pleasant Valley Substation depending on the outcome of the NYISO's 2017 Class Year Study.	for the new line from Knickerbocker. <i>(This additional work is not included in the independent estimates.)</i>
3	Design Concern - Pleasant Valley Substation (Con Ed Owned)	Lack of space for additional panels in the control house.	The control house will need to be expanded to accommodate the additional panels. This is more apparent with the additional line for the Cricket Valley Project. <i>(Expansion of the control house is included in the independent estimates.)</i>
4	Visual Concern – Proposed Transmission Lines	Potential of public opposition due to visual impact. NYS PSC has encouraged that new structures have minimal increase in height.	ITC's proposal has a less significant structure height increase than other developer proposals (46% with 5-ft. or less increase and only 1% with 5-ft. to 10-ft. increase) but increases the total number of structures by 15%. The increase in the total number of structures could increase the risk of adverse impact on visual and agricultural resources. Impact of structure placement will have to be determined during detailed engineering. This is considered one of the highest risks for this proposal.
5	Obtaining Site Control and Property Acquisition	Proposal utilizes existing ROW owned by National Grid.	Negotiations with the incumbent utility could result in potential cost and schedule implications.

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		<i>De minimis</i> property may need to be acquired for access and construction marshalling yards.	The review team’s schedule provides two years for negotiation and procurement of ROW beginning with the notice to proceed. This should be sufficient time making this a potential but low risk. The estimate contingency should be sufficient to cover potential increased costs which is considered a low probability.
6	Operation Concern – Triple Circuit Transmission Design	Developer proposes using triple circuit structures between Churchtown Substation and Pleasant Valley Substation. The proposed structures are in a two-pole configuration with one 345 kV circuit attached horizontally to an upper crossarm and two 115 kV circuits attached side by side horizontally to a lower crossarm.	The proposed compact design conserves space within the transmission corridor but creates an operations concern. Future maintenance of the transmission circuits and associated structures may depend on the outage availability of all the circuits attached.  A maintenance plan must be developed prior to putting this configuration into service.

#### 4.4. Expandability

In evaluating the expandability of a proposed regulated Public Policy Transmission Project, the NYISO OATT section 31.4.8.1.3 prescribed the following: “The ISO will consider the impact of the proposed project on future construction. The ISO will also consider the extent to which any subsequent expansion will continue to use this proposed project within the context of system expansion.”

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The review team conducted an initial review of the expansion capability of the Developers' proposals. The review centered predominately on the Developers' claimed expandability as presented in their proposals:

**4.4.1. Items that may be considered common to all proposals:**

Many of the more common design approaches that could be employed on a transmission project to afford future expandability are not applicable since the objective of this project is to utilize existing rights-of-way (ROW). Much of the existing transmission ROW will be fully utilized in construction of this project but there is some opportunity for expansion.

Potential transmission expansion includes the following:

- All proposals for Segment A involve replacement of the existing Porter-Rotterdam 230 kV circuits, line #30 and line #31, with an Edic to New Scotland 345 kV line. This will provide space for future use of the existing ROW and may allow for the addition of another circuit from Edic or Porter to Princetown Junction within the existing ROW, based on current electrical clearance requirements. Any proposal to construct an additional circuit is subject to the applicable permitting and regulatory requirements, such as public acceptance of visual impact, EMF compliance, compatibility with existing gas facilities and regulatory approvals.
  - For the base proposals, NextEra affords the most efficient use of the ROW by utilizing 100 ft. single-pole delta structures. National Grid/Transco, NAT/NYPA and ITC propose using 65-85 ft. H-pole structures, which requires the use of more space within the ROW. In all base proposals, there may be adequate space in the ROW remaining for an additional 345 kV line. However, a compact transmission line configuration may be required to fit a future 345 kV line in the remaining ROW.
  - All alternative proposals may also provide adequate space within the ROW for a future line with the exception of NAT/NYPA T027. The NAT/NYPA T027 double circuit line proposal utilizes all 4 existing circuit positions for the first 12 miles out of Edic.
  - During detailed engineering the placement of structures could be optimized to maximize the remaining ROW.
  - Refer to the table below for summary of the ROW requirements for each Developer's projects in the Edic to Princetown Junction corridor.

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Summary of ROW Requirements for Segment-A Projects From Edic to Princetown Junction							
Sector	Corridor Width (ft.)	Developer	Proposal	Proposed Structure Configuration	ROW Reqd. (ft.)	ROW Corridor Remaining (ft.)	Remarks
Edic SS to Princetown Jct	200	NGRID/Transco	T018	1 Ckt – 345 kV H-pole Horizontal	120	80	Sufficient reserved ROW for expansion utilizing Compact Vertical Configuration
		NextEra	T021	1 Ckt – 345 kV Single Pole Delta	80	120	Sufficient reserved ROW for expansion utilizing H-pole Horizontal Configuration
		NAT/NYPA	T026 & T028	1 Ckt – 345 kV H-pole Horizontal	140	60	Sufficient reserved ROW for expansion utilizing Compact Vertical Configuration
		NAT/NYPA	T027	2 Ckt – 345 kV Single Pole Vertical	105	95	Sufficient reserved ROW for expansion utilizing Single Pole Delta Configuration with exception of the first 12.6 miles out of Edic
		ITC	T031	1 Ckt – 345 kV H-pole Horizontal	100	100	Sufficient reserved ROW for expansion utilizing Single Pole Delta Configuration

- The new Edic to New Scotland line for Segment A could be designed for double circuit capability similar to the NAT/NYPA T027 double circuit line proposal.
- Transmission lines could be constructed with higher ampacity conductor or re-conducted in the future.
- Most proposals provide for future expansion of substations or could be expanded to provide for additional line terminals and transformers in the new substations.

**4.4.2. Items specific to each proposal:**

Potential transmission expansion for each Developer’s specific proposal is discussed in the summary table below.

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<b>Significant items specific to each developer: Potential Transmission Expansion for Segment A</b>				
<b>Proposal</b>	<b>Segment</b>	<b>Developer</b>	<b>Transmission Line Expandability</b>	<b>Substation Expandability</b>
T018 - New York Energy Solution Segment A	A	National Grid/Transco	No significant expandability to NGRID's proposal beyond the common items mentioned above.	At Rotterdam Substation, the 345 kV gas-insulated substation design provides one open 345 kV bay position and room for additional 345 kV bays. Design also provides ability to connect one additional 345 kV/115 kV transformer to support the local transmission system. Lastly, the design allows for the rebuilding of the 115 kV straight bus configuration into a breaker-and-a-half configuration.
T021 - Enterprise Line: Segment A	A	NextEra	No significant expandability to NextEra's proposal beyond the common items mentioned above.	NextEra is proposing a "Princetown" substation approximately 3 miles east of the junction and 2 miles west of Rotterdam Substation on a new greenfield site. The design provides two open 345 kV bay positions and room on the property for adding bays. NextEra's proposal maintains the existing and aging Rotterdam 230 kV yard intact.

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T025 - Segment A + 765 kV Proposal	A	NYPA/North American Transmission	Including the common items above, the Developer states that converting the Marcy-New Scotland-Knickerbocker 345 kV transmission lines to 765 kV could significantly increase Central East transfer capability. (Note that T025 includes this conversion.)	At Rotterdam, rebuilding and relocating the 345 kV substation allows for the rebuilding of the 115 kV straight bus configuration into a breaker-and-a-half configuration. A new Princetown Substation is proposed at the junction of the 345 kV Edic-New Scotland line and the 230 kV Porter to Rotterdam lines. Due to the proximity to the neighboring properties, constructing or expanding the substation will be difficult. At New Scotland, proposal T025 eliminates the 345 kV line to Alps thus creating an open line terminal position.
T026 - Segment A Base Proposal	A	NYPA/North American Transmission	No significant expandability to NAT/NYPA's proposal beyond the common items mentioned above.	At Rotterdam, rebuilding and relocating the 345 kV substation allows for the rebuilding of the 115 kV straight bus configuration into a breaker-and-a-half configuration.

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T027 - Segment A Double Circuit Proposal	A	NYPA/North American Transmission	No significant expandability to NAT/NYPA's proposal beyond the common items mentioned above.	<p>At Rotterdam, rebuilding and relocating the 345 kV substation allows for the rebuilding of the 115 kV straight bus configuration into a breaker-and-a-half configuration.</p> <p>A new Princetown Substation is proposed at the junction of the 345 kV Edic-New Scotland line and the 230 kV Porter to Rotterdam lines. Due to the proximity to the neighboring properties, constructing or expanding the substation will be difficult.</p> <p><i>At Edic, it should be noted that a potential spare terminal position (shown on the Developer's drawings) in the proposed bay north of Bay #1 is already occupied by a 345 kV capacitor bank.</i></p>
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T028 - Segment A Enhanced Proposal	A	NYPA/North American Transmission	No significant expandability to NAT/NYPA's proposal beyond the common items mentioned above.	<p>At Rotterdam, rebuilding and relocating the 345 kV substation allows for the rebuilding of the 115 kV straight bus configuration into a breaker-and-a-half configuration.</p> <p>A new Princetown Substation is proposed at the junction of the 345 kV Edic-New Scotland line and the 230 kV Porter to Rotterdam lines. Due to the proximity to the neighboring properties, constructing or, if constructed, expanding the substation will be difficult.</p>
T031 - 16NYPP1-1A AC Transmission	A	ITC	No significant expandability to ITC's proposal beyond the common items mentioned above.	ITC's proposal does not provide any additional bays at Princetown or Rotterdam Substations. ITC's proposal maintains the existing and aging Rotterdam 230 kV yard intact. Additionally, physical limitations at these properties may preclude future expansions without purchasing additional property.
<b>Potential Transmission Expansion for Segment B</b>				
<b>Proposal</b>	<b>Segment</b>	<b>Developer</b>	<b>Transmission Line Expandability</b>	<b>Substation Expandability</b>

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T019 - New York Energy Solution Segment B	B	National Grid/Transco	No significant expandability to NGRID's proposal beyond the common items mentioned above.	At Knickerbocker Substation, the proposed design provides one open 345 kV bay position. The Knickerbocker design also allows the 345 kV ring bus configuration to be converted to a breaker-and-a-half configuration with room on the property for adding bays. At Churchtown Substation, design provides one open 115 kV bay position. Additional breaker-and-a-half bays can be added in the future.
T022 - Enterprise Line: Segment B	B	NextEra	No significant expandability to NextEra's proposal beyond the common items mentioned above.	At North Churchtown Substation, the proposed design provides one open 115 kV bay position and with room on the property for adding bays. The southern-most bay could also be built out to a breaker-and-a-half configuration. At Knickerbocker Substation, the proposed design provides one open 345 kV bay position. The Knickerbocker design also allows the 345 kV ring bus configuration to be converted to a breaker-and-a-half configuration with room on the property for adding bays.

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T023 - Enterprise Line: Segment B- Alt	B	NextEra	No significant expandability to NextEra’s proposal beyond the common items mentioned above.	Same comments as stated for T022 also apply to T023.
T029 - Segment B Base Proposal	B	NYPA/North American Transmission	No significant expandability to NAT/NYPA’s proposal beyond the common items mentioned above.	The Developer proposes a new 115 kV breaker-and-a-half substation and eliminates the existing NYSEG Churchtown substation. The three-bay substation is proposed for south of the existing substation and north of Orchard Road. This location will permit future expansion of the proposed substation to the north. At Knickerbocker, the Developer’s design allows the 345 kV ring bus configuration to be converted to a breaker-and-a-half configuration with room on the property for adding bays.

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T030 - Segment B Enhanced Proposal	B	NYPA/North American Transmission	No significant expandability to NAT/NYPA's proposal beyond the common items mentioned above.	The Developer proposes a new 115 kV breaker-and-a-half substation and eliminates the existing NYSEG Churchtown substation. The three-bay substation is proposed for south of the existing substation and north of Orchard Road. This location will permit future expansion of the substation to the north. At Knickerbocker, the Developer's design allows the 345 kV ring bus configuration to be converted to a breaker-and-a-half configuration with room on the property for adding bays.
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T032 - 16NYPP1-1B AC Transmission	B	ITC	No significant expandability to ITC's proposal beyond the common items mentioned above.	At Knickerbocker Substation, the design provides one open 345 kV bay position and one open 115 kV bay position. The Knickerbocker design also allows the 345 kV and 115 kV ring bus configurations to be converted to a breaker-and-a-half configuration. The detailed design could also optimize the physical layout on the property possibly providing room for additional bays. Additionally, during detailed design, the ability to connect up to two 345 kV – 115 kV transformers to support the local transmission system could be provided.
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#### 4.5. Site Control and Real Estate

##### 4.5.1. Site Control

In evaluating site control of a proposed regulated Public Policy Transmission Project, The NYISO OATT section 31.4.8.1.6 specifies that the evaluation will assess the following: “The extent to which the Developer of a proposed regulated Public Policy Transmission Project has the property rights, or ability to obtain the property rights, required to implement the project. The ISO will consider whether the Developer: (i) already possesses the rights of way necessary to implement the project; (ii) has completed a transmission routing study, which (a) identifies a specific routing plan with alternatives, (b) includes a schedule indicating the timing for obtaining siting and permitting, and (c) provides specific attention to sensitive areas (*e.g.*, wetlands, river crossings, protected areas, and schools); or (iii) has specified a plan or approach for determining routing and acquiring property rights.”

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The review team conducted a review of the Developers’ property rights acquisition plans contained in their proposals. The review centered on the Developers’ information and plans presented in their proposals and additional information provided in response to NYISO RFIs.

In all proposals, the following is common for the property rights acquisition process:

- The NYPSC prescribed specific requirements in Appendix B of its Order Finding Transmission Needs Driven by Public Policy Requirements, dated December 17, 2015.
  - No transmission solution shall be selected that requires the acquisition of new permanent transmission ROW, except for *De-minimis* acquisitions that cannot be avoided due to unique circumstances. The NYPSC specified that for the purposes of meeting this criterion, the transfer or lease of existing transmission ROW property or access rights from a current utility company owner to a Developer shall not be considered such an acquisition.
  - The selection process for transmission solutions shall favor transmission solutions that minimize the acquisition of property rights for new substations and substation expansions. The NYPSC specified that for the purposes of this criterion, the transfer or lease of existing property rights from a current utility company owner to a Developer shall not be considered such an acquisition.
  - No transmission solution shall be selected that includes a crossing of the Hudson River, either overhead, underwater, in riverbed, or underground, or in any other way, by any component of the transmission facility.

The non-incumbent Developers all claim two common rights in obtaining property:

- The Developers cite the NYPSC’s “Order Finding Transmission Needs Driven by Public Policy Requirements” as requiring incumbent utilities to engage in non-discriminatory, good faith negotiation of terms in obtaining rights to use an incumbent utility’s ROW. The NYPSC’s order specifically stated that the *“Commission expects the utility company owner to bargain in good faith to reach an agreement with the developer of the transmission solution as to property access and compensation as it would for other linear project developers that seek to co-locate on utility property.”* Further, the NYPSC stated that *“incumbent utilities should offer competitors the same terms they offer Transco; there should be no bias shown to Transco.”*

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- If negotiations with private land owners are unsuccessful, the Developers believe that under New York State Law, they will have eminent domain authority after certification of a route by the NYPSC.

Below is a summary of the team’s review:

#### Summary of Property Rights Acquisition

#	Developer	Property Rights Acquisition
T018 T019	National Grid/Transco	<p>NGRID completed a routing study and states that “the ROW targeted for this project is either fee-owned by, or under the control (via easement or permit),” of NGRID.</p> <p>NGRID will transfer ownership of all assets to the Transco.</p>
T025 T026 T027 T028 T029 T030	NYPA/North American Transmission	<p>The proposed project’s route would use existing ROW owned by the incumbent utility (National Grid).</p> <p>NAT/NYPA lays out a plan in their proposal (Attachment C.2A Property Right Acquisition Plan) for obtaining site control. They would rely on NYPA, which has extensive experience in negotiating and obtaining easements, including from other incumbent utilities, to lead negotiations with the other New York Transmission Owners.</p> <p>NAT/NYPA does not yet possess the required ROWs. However, they have a documented plan to obtain the real property.</p>
T021 T022 T023	NextEra	<p>The proposed project’s route would use existing ROW owned by the incumbent utility (National Grid) with the exception of property to be acquired for the Princetown Junction substation. NextEra has already obtained an option to purchase the real estate for the proposed substation site. NextEra lays out a plan for obtaining site control in their proposal (Attachment B Requirement #7).</p> <p>NextEra does not yet possess the required ROWs. However, it has a documented plan to obtain the necessary real property.</p>

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T031 T032	ITC	<p>Their route would use existing ROW owned by the incumbent utility (National Grid). It is likely that some additional property will be required to construct their proposed Princetown Junction Substation.</p> <p>ITC lays out a plan for obtaining site control in their proposal (Attachment C.2A)</p> <p>ITC does not yet possess the required ROWs. However, they have a documented plan to obtain the real property.</p>
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#### 4.5.2. Real Estate Analysis

A review of the proposed routing for the transmission lines and substations was completed to identify property that each Developer would need to obtain for their proposed project. Cost estimates for the property were derived by obtaining recent comparable sales and tax assessments from municipal tax records in the town and county where the property is located and commercially available software. The estimated cost of the required property was included in the independent cost estimates.

All Developers propose to utilize existing incumbent-owned property and ROW with the following exceptions:

- All proposals for Segment A will likely require the acquisition of easements to meet EMF guidelines in the Princetown Junction to New Scotland corridor. NAT/NYPA's T025 765 kV line conversion also requires additional easements to meet EMF guidelines.
- *De minimis* property rights may be required for construction laydown area and access, tree trimming or danger tree clearing.
- Development of a new substation at the Princetown Junction may require additional property or easements.
  - Proposals T018 and T026 do not include a substation at Princetown Junction.
  - NextEra proposal T021 proposes to build the substation at Princetown Junction on a new greenfield site for which they have obtained an option to acquire.
  - Proposal T031 proposes to tie all seven lines into a substation at Princetown Junction, which will require additional property.
  - Proposals T025, T027, and T028 propose smaller substations at Princetown Junction with four breaker ring bus arrangements or GIS equipment that may fit

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in the existing property. Although it appears that placing these stations on the site is possible, the review team has identified this as a potential risk that will need to be carefully considered and, if necessary, potentially mitigated during detailed engineering and licensing development.

- o A summary of substation property requirements for Segment A is shown below. The amount of property required for each proposal is listed by the acreage within exiting utility owned property and the amount that needs to be acquired from a non-utility owner.

#### Substation Property Requirements for Segment A

PROPOSAL	DEVELOPER	SUBSTATION	COUNTY	OWNER NAME	
				NATIONAL GRID/ NIAGARA MOHAWK (ACRES)	NON-UTILITY (ACRES)
T018	National Grid / NY Transco	Rotterdam Substation (Extension)	Schenectady	2.60	
T021	NextEra Energy	Princetown Substation (New)	Schenectady		24.0
T025	NYPA / NAT	Knickerbocker Substation (New)	Rensselaer	30.00	
		Princetown Substation (New)	Schenectady	3.00	
		Rotterdam Substation (New)	Schenectady	7.50	
T026	NYPA / NAT	Rotterdam Substation (New)	Schenectady	7.50	
T027	NYPA / NAT	Edic Substation (Extension)	Oneida	1.25	
		Princetown Substation (New)	Schenectady	3.00	
		Rotterdam Substation (New)	Schenectady	7.50	
T028	NYPA / NAT	Princetown Substation (New)	Schenectady	3.00	
		Rotterdam Substation (New)	Schenectady	7.50	
T031	ITC	Princetown Substation (New)	Schenectady	5.50	2.6
		Rotterdam Substation (Extension)	Schenectady	2.50	

#### 4.6. Operational Plan

The review team conducted an evaluation of the Developers' operations and maintenance (O&M) plans detailed in their proposals. The review centered on the Developers' proposals and additional information provided in response to a NYISO RFI submitted to Developers in November 2017. The following are common elements of the Developers O&M plans. :

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- All O&M activities will comply with NERC regulations.
- Real time system operations will be conducted by the NYISO.
- Control center schedules will be 24-7-365.

Below is a summary of the review team’s review of the proposed O&M plans . The review team did not identify any major flaw with any Developers’ O&M plans. With the exception of ITC, all Developers propose to operate their facilities from an in-state control center.

<b>Summary Proposed of O&amp;M Plans</b>			
#	Developer	Operations	Maintenance
T018 T019	National Grid / TRANSCO	NGRID/TRANSCO did not provide an O&M plan with its proposal. However, the review team recognizes that as a New York Transmission Owner, NGRID has a demonstrated history of operating and maintaining its transmission and distribution systems.	See comment under Operations.
T021 T022 T023	NextEra	NextEra will build and operate a primary and backup control center within New York State. Multi-site EMS with redundant servers and telecommunication will interface real-time situational awareness with the NYISO and neighboring control areas. Power Delivery and Support Center in Florida provides added backup. Policies and training program for operators to meet NERC, Transmission Owner’s and System Operator standards.	Transmission line and substation maintenance activities will be managed and performed by NextEra staff supplemented with third-party contractors. NextEra has experience maintaining transmission systems in other areas of the country and provided a detailed maintenance plan.
T025 T026 T027 T028 T029 T030	North American Transmission/ New York Power Authority	Developer states real-time system monitoring and control center services will be provided by NYPA from their Blenheim Gilboa Facility.	Transmission line and substation maintenance will be managed by local NYPA staff. Maintenance activities will be performed by third-party contractors. NYPA has

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			experience maintaining 1,400 miles of transmission with an in-house staff of engineers, operators, planners, electricians and line engineers.
T031 T032	ITC	ITC Holdings currently operates and maintains 15,000 miles of transmission and 557 substations from a control center in Novi, Michigan and proposes to operate the proposed facilities from that center.	ITC uses dedicated O&M contractors under exclusive contract for storm restoration. ITC Holdings in-house staff of engineers, designers, P&C, SCADA and construction supervisors are available to assist after the project is put in-service. ITC has Line Outage Guidelines and an Emergency Operations Plan that incorporates use of a local utility's workforce with whom they would partner to provide O&M services.

#### 4.7. Field Reviews

Field review of proposed transmission line routes and substations was completed by the review team. The results of those field reviews are documented in a report supplemented with checklists and maps marked with comments and observations. The review team used the results to develop the project scheduling and cost estimates and identify potential issues and risks with the proposed design, siting and routing.

#### 4.8. Work Plans

The Developers' work plans should provide a detailed description of the overall work plan from start to finish; should list items to be done by in-house staff; and list services that will be performed by consultants or contractors. No significant deficiencies were found in the work plans and processes proposed by any of the Developers. A high-level summary of the work plans follows:

- All qualified Developers have a history of managing successful transmission and substation design and construction projects. There was variation in the degree of self-performance of work versus using third-party contractors. All Developers propose to manage internal and external resources.

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- All Developers include work plan activities in their estimates and schedules. More detailed analysis of the construction work plans is discussed in the Schedule analysis section of this report.
- All Developers propose Permitting and Regulatory activities to be performed by a mix of in-house staff and outside consultants.
- All Developers propose to contract for a portion of the engineering and self-perform the remainder of the engineering work.
- All Developers propose to contract transmission line and substation surveying.
- All Developers propose to contract for site work and construction. National Grid plans to contract out or self-perform above grade/structures and electrical construction.
- NextEra and ITC indicate that they would share public outreach efforts with public relations firms. All Developers signal the importance of early and careful attention to public outreach.
- It was not possible to evaluate external team members at this stage, as they are expected to be selected competitively after award from among leading engineering, geo-technical, environmental and construction firms.

#### **4.9. Environmental**

All of the Developers’ proposals recognize the need for environmental studies, permits and approvals from various federal and state government agencies. Standard permit requirements include: transmission approval from the NYPSC under Article VII; wetland delineation and protection; archeological studies; storm water pollution prevention requirements; stream protection; invasive species management; agricultural land protection; and rare, threatened and endangered species surveys and protection. The Developers acknowledge the possibility that their proposals could require modification to address additional permit conditions. At this point in the project planning process, it is difficult to ascertain what those permit conditions would be. Based on available information, there do not appear to be any environmental issues that would prevent the projects from being constructed. The following is a general discussion of the most significant environmental issues and factors that could affect each of the proposals.

##### **4.9.1. Transmission Lines**

All the projects propose utilizing the same existing ROW for the transmission lines, except for the additional 765 kV line proposed in T025 proposal. Any additional clearing of the ROW to accommodate the proposed transmission lines is expected to proportionally increase the environmental impacts and risks. These impacts and risks are further described below.

##### **4.9.1.1. Clearing of ROW**

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The tables below present the estimated acreage that would need to be cleared of trees to accommodate the transmission lines for each proposed project. The ROW being cleared will require environmental and archeological studies. These studies could discover sensitive areas that may require re-routing of the transmission line or relocating structures to avoid area impacts. The projects will also require vegetative mowing within existing ROWs, which is typically considered a slight environmental impact, and has not been included in the tables below.

<b>AC TRANSMISSION PROJECT SEGMENT A:</b> Estimate of Heavy Clearing (Acres)						
T018	T021	T025	T026	T027	T028	T031
19	0	132	34	0	34	38

<b>AC TRANSMISSION PROJECT SEGMENT B:</b> Estimate of Heavy Clearing (Acres)					
T019	T022	T023	T029	T030	T032
40	10	19	28	34	19

#### 4.9.1.2. ROW Access, Clearing, and New Structures in Wetlands

The projects, including the substation footprint and/or the new transmission structures, could have a permanent impact on regulated wetlands. The table below presents the estimated acreage of wetland impacts including permanent wetland loss from the new structures footprints, and the estimated acreage of forested wetlands that will likely be cleared by each project due to the proposed transmission lines. Forested wetlands are a very valuable ecological resource in New York, and proposed tree clearing will require mitigation of impacts, including possible replacement offsite. While an estimate of these mitigation costs has been provided, there is the potential that project regulatory approval could take additional time, and an alternate structure location or construction access may be required to avoid the wetland entirely.

Access through wetlands and locating structures in wetlands will need to be avoided to the greatest extent practical. Black Creek Marsh State Wildlife Management Area, located on

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the Princetown-New Scotland section of Segment A, will present some difficult access issues that will have to be approved by the New York State Department of Environmental Conservation (NYSDEC). This could require the use of specialized equipment or possible relocation of the transmission line.

Additionally, temporary wetland impacts are anticipated to allow construction access and the placement of temporary matting will be required to minimize surface damages to wetlands. Post-construction restoration efforts may also be required depending on the severity of these construction impacts (e.g., soil disturbance, vegetation dieback).

Regarding permanent impacts to wetlands, loss of wooded wetlands due to ROW clearing, and loss of any wetlands due to proposed structure installations (assuming 60 square feet for each pole footprint) are estimated in the tables below. If on-site mitigation is not possible due to required ROW maintenance, then offsite mitigation may be necessary.

<b>AC TRANSMISSION PROJECT A:</b>						
Estimate of Impacted Wetlands (Acres)						
T018	T021	T025	T026	T027	T028	T031
0.456	0.198	1.257	0.46	0.493	0.463	0.561

<b>AC TRANSMISSION PROJECT SEGMENT B:</b>					
Estimate of Impacted Wetlands (Acres)					
T019	T022	T023	T029	T030	T032
0.055	0.064	0.064	0.064	0.064	0.072

For the project to be approved under the United States Army Corps of Engineers (USACE) Nationwide Permit Program (NWP 12 Utility Line Activities), the actions required for the construction, maintenance, repair, and removal of utility lines and associated facilities (including the construction of access roads) in waters of the United States (i.e. wetlands) cannot result in the loss of greater than ½ acre of non-tidal waters for a single and complete project. If the project does not qualify for the Nationwide Permit, an Individual Permit will be required, which may involve a longer review timeframe.

#### 4.9.1.3. Clearing of Protected Species Habitat

The project area may include critical habitats for rare, threatened or endangered plant or animal species, such as the Northern Long Eared Bat, Bog Turtle, Karner Blue Butterfly

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and/or Dwarf Wedgemussel. If such habitat is identified, agency review and response times are likely to increase along with timeframe for obtaining project approvals, and an alternate route may be required to protect the critical habitat. Seasonal restrictions may also be imposed to control ROW mowing or clearing, which could further delay the project construction timeline.

**4.9.1.4. Visual Impacts**

Typically, visual impacts are categorized as minor, moderate or significant/major with regards to how project structures may be seen from sensitive receptors (i.e., parks, trails, scenic roads, historic sites) and overall community/neighborhood character. Visual assessments of the proposed transmission lines may also be required, which would include visual simulations and viewshed maps. Many factors affect the visibility and visual impact of the proposed lines, including surrounding vegetation, presence of existing lines, topography, land use, structure design and the number of structures. If the line is determined to impact scenic resources or is not compatible with the character of the community, the line configuration could require modifications during final design to reduce the visual impact. The type of structure will affect its visibility with lattice type towers having the highest potential visual impact. No lattice towers are proposed for this project and most of the structures being removed are lattice towers. All Developers have proposed the use of steel or concrete monopole and H frame structures. Since all of the proposed projects are essentially using the same existing ROW, with the exception of the 765 kV portion of T025 proposal, the remaining variable for evaluating potential visual impact is the structure height and the number of structures.

In its December 17, 2015 Order, the NYPSC noted that it “will not mandate criteria to be applied by the NYISO, but all proposers of transmission solutions should be aware as they prepare their submissions that minimizing structure heights will be an important issue in the siting review process so applicants should be careful to not lock themselves into designs that could not later be approved. All applicants are encouraged to minimize the heights of the proposed structures while keeping them within the context of their 2015 proposals. In making this statement, the Commission is not in any way suggesting that it would be suitable for applicants to appropriate the structure designs of other applicants.” The NYPSC concluded that height increases of less than 25 feet over existing structures will not create a significant adverse visual impact of a regional nature (December 12, 2015 Order at p. 35). The construction of new structures even with minimal increase in height may result in public opposition due to their potential local visual impact. The PSC determined that the local visual impacts will be addressed in the Article VII siting proceedings.

**Segment A**

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The height of the structure may increase its visibility and, therefore, potentially increase the visual impact. The following tables summarize the estimated difference in height of the existing structures being removed and proposed structures for the Segment A projects. The comparison demonstrates the relative height differences for the proposed projects. It should be noted that the proposed lines parallel the existing line #18, between Princetown Junction and New Scotland, which is constructed for 765 kV operation and has structures ranging in height from 135 feet to 195 feet where the proposed structures range in height from 60 to 145 ft. This may reduce the visual impact of the proposed line. Green highlights in the table below indicates that no visual impacts are expected due to the height of the proposed structures. When structures are replaced, height increases over 10 feet are typically classified as “severe” visual impacts, absent a viewshed analysis.

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Proposed Height Increase for Segment A	Number of Structures					
	T018	T021	T025	T026/T028	T027	T031
1. Less than 0 ft.	62	0	269	269	19	28
2. Same Ht.	9	0	7	7	11	581
3. From 0.1ft to 5 ft.	30	3	51	51	76	69
4. From 5.1 ft to 10 ft.	56	5	33	33	5	10
5. From 10.1 ft to 15 ft.	72	45	35	34	47	0
6. From 15.1 ft to 20 ft.	97	72	65	66	40	2
7. From 20.1 ft to 25 ft.	74	490	38	38	69	1
8. From 25.1 ft to 30 ft.	68	67	9	9	204	0
9. From 30.1 ft to 40 ft.	52	67	18	18	95	0
10. From 40.1 ft to 50 ft.	21	21	10	9	34	0
11. From 50.1 ft to 60 ft.	23	4	6	1	22	0
12. From 60.1 to 70 ft.	8	1	1	0	1	0
13. From 70.1 to 80 ft.	2	1	1	1	4	0
14. From 80.1 to 90 ft.	0	0	5	0	4	0
15. From 90.1 to 100 ft.	1	0	3	1	0	0
16. From 100.1 to 110 ft.	0	0	0	0	0	0
17. From 110.1 to 120 ft.	0	0	2	0	0	0
Total	575	776	553	537	631	691

	Percent of Structures					
	T018	T021	T025	T026/T028	T027	T031
1. Less than 0 ft.	10.8%	0.0%	48.6%	50.1%	3.0%	4.1%
2. Same Ht.	1.6%	0.0%	1.3%	1.3%	1.7%	84.1%
3. From 0.1ft to 5 ft.	5.2%	0.4%	9.2%	9.5%	12.0%	10.0%
4. From 5.1 ft to 10 ft.	9.7%	0.6%	6.0%	6.1%	0.8%	1.4%
5. From 10.1 ft to 15 ft.	12.5%	5.8%	6.3%	6.3%	7.4%	0.0%
6. From 15.1 ft to 20 ft.	16.9%	9.3%	11.8%	12.3%	6.3%	0.3%
7. From 20.1 ft to 25 ft.	12.9%	63.1%	6.9%	7.1%	10.9%	0.1%
8. From 25.1 ft to 30 ft.	11.8%	8.6%	1.6%	1.7%	32.3%	0.0%
9. From 30.1 ft to 40 ft.	9.0%	8.6%	3.3%	3.4%	15.1%	0.0%
10. From 40.1 ft to 50 ft.	3.7%	2.7%	1.8%	1.7%	5.4%	0.0%
11. From 50.1 ft to 60 ft.	4.0%	0.5%	1.1%	0.2%	3.5%	0.0%
12. From 60.1 to 70 ft.	1.4%	0.1%	0.2%	0.0%	0.2%	0.0%
13. From 70.1 to 80 ft.	0.3%	0.1%	0.2%	0.2%	0.6%	0.0%
14. From 80.1 to 90 ft.	0.0%	0.0%	0.9%	0.0%	0.6%	0.0%
15. From 90.1 to 100 ft.	0.2%	0.0%	0.5%	0.2%	0.0%	0.0%
16. From 100.1 to 110 ft.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
17. From 110.1 to 120 ft.	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%

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Based upon the height increase comparison estimates above, proposal T031 would have the least potential visual impacts by a considerable margin, although it does use more structures than all other proposals, except proposal T021. Proposal T031 is also removing 20 additional miles of lattice structures along Princetown Junction to New Scotland (circuit 14), which none of the other proposed projects are removing except for 6.3 mile being removed by T027. Using the 10-foot height increase as the basis for ranking the potential visual impacts, proposals T026 and T028 would have the second lowest visual impact, with about a third of the structures having a height increase of 10 feet or more. Proposal T018 would be fourth followed by proposal T027. Proposal T021 would have the most potential visual impact with 99% of the structures having a height increase of more than 10 feet. In addition, proposal T021 is proposing the greatest number of structures.

Proposal T025 would have the third lowest overall potential visual impact based upon the table and method discussed above. However, the most significant potential visual impacts for proposal T025 are due to the proposed height increase for the 2.5 miles of new 765 kV transmission line structures. This will involve 16 new two and three pole structures that range in height from 130 to 165 feet. In the section of the line where there is the existing 115 kV transmission line, the four new structures will be approximately 80 feet taller than the existing structures. On the other sections, the height increase will be approximately 40 feet or more.

**Segment B**

The following tables summarize the estimated difference in height of existing structures being removed and proposed structures for Segment B projects. The comparison demonstrates the relative height differences for the proposed projects. Green highlights in the table below indicates no visual impact due to height of the proposed structures. When structures are replaced, height increases over 10 feet are typically classified as “severe” visual impacts, absent a viewshed analysis.

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Proposed Height Increase for Segment B	Number of Structures				
	T019	T022	T023	T029/T030	T032
1. Less than 0 ft.	87	49	6	222	240
2. Same Ht.	3	1	2	77	6
3. From 0.1ft to 5 ft.	97	58	60	44	218
4. From 5.1 ft to 10 ft.	108	181	114	44	6
5. From 10.1 ft to 15 ft.	66	116	227	12	0
6. From 15.1 ft to 20 ft.	20	0	0	3	0
7. From 20.1 ft to 25 ft.	12	0	0	1	0
8. From 25.1 ft to 30 ft.	4	0	0	0	0
9. From 30.1 ft to 40 ft.	4	0	0	0	0
10. From 60.1 ft to 70 ft.	0	0	0	2	0
Total	401	405	409	405	470

	Percent of Structures				
	T019	T022	T023	T029/T030	T032
1. Less than 0 ft.	21.7%	12.1%	1.5%	54.8%	51.1%
2. Same Ht.	0.7%	0.2%	0.5%	19.0%	1.3%
3. From 0.1ft to 5 ft.	24.2%	14.3%	14.7%	10.9%	46.4%
4. From 5.1 ft to 10 ft.	26.9%	44.7%	27.9%	10.9%	1.3%
5. From 10.1 ft to 15 ft.	16.5%	28.6%	55.5%	3.0%	0.0%
6. From 15.1 ft to 20 ft.	5.0%	0.0%	0.0%	0.7%	0.0%
7. From 20.1 ft to 25 ft.	3.0%	0.0%	0.0%	0.2%	0.0%
8. From 25.1 ft to 30 ft.	1.0%	0.0%	0.0%	0.0%	0.0%
9. From 30.1 ft to 40 ft.	1.0%	0.0%	0.0%	0.0%	0.0%
10. From 60.1 ft to 70 ft.	0.0%	0.0%	0.0%	0.5%	0.0%

Based upon the estimates and criteria described above, proposal T032 would have the least significant potential visual impact due to height increase; however, it adds 61 (15%) more structures than any other proposed project which could have additional potential visual impacts. Proposal T029 and T030 would have the second least potential visual impact with only 5% of the structures increasing in height by more than 10 feet. Proposals T019 and T022 would have comparable potential visual impacts, with 26% and 29% of the structures increasing in height by more than 10 feet, respectively. However, proposal T022 is proposing to remove 32.3 less miles of lattice structures along Churchtown to Pleasant Valley (circuits 12 and 13) than all the other proposed projects. Proposal T023 would have the most significant potential visual impact, if only the height increase is considered, with 56% of the structures increasing in height by 10 to 15 feet.

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**4.9.1.5. Agricultural Impacts**

Early coordination with agricultural landowners, and consideration of potential impacts to farmland will be needed for the proposed project. Siting and construction coordination will be needed to minimize impacts on prime agricultural lands and to limit loss of crop production. Site restoration of disturbed and compacted soils will be required. Herbicide use may be restricted during construction and long-term ROW maintenance operations. Transmission line siting near Certified Organic Farms may require additional planning and consideration for compliance with organic certification. If the proposed transmission line would cross properties within an Agricultural Conservation Easement Program or Land Trust, then additional agency coordination will be needed.

The estimated acreage of agricultural land that will be temporarily impacted by each proposed project within their respective segments is nearly equivalent. Assuming 20-foot-wide matting is used where the ROW is adjacent to Agricultural Districts or crop land, the estimated temporary impact to Segment A would be 94.5 acres, and the estimated temporary impact to Segment B would be 24.75 acres.

**4.9.2. Substations and Switching Stations**

Proposed projects do vary in the number, size and location of new or expanded substations or switching stations. Both temporary and permanent environmental impacts could result from the construction and installation of the proposed stations, including: visual, noise, tree clearing, and increased stormwater run-off (which will likely require construction of stormwater retention). Fewer or smaller stations would have less environmental impact. The table below provides the total estimated area required for the new or expanded stations, including the estimated area for stormwater retention basins, and the total number of stations.

<b>AC TRANSMISSION PROJECT SEGMENT A:</b> Estimated Station Area (Acres/(number))						
T018	T021	T025	T026	T027	T028	T031
2.6	24.0	40.5	7.5	11.8	10.5	10.6
(1)	(1)	(3)	(1)	(3)	(2)	(2)

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<b>AC TRANSMISSION PROJECT SEGMENT B: Estimated Station Area (Acres/(number))</b>					
T019	T022	T023	T029	T030	T032
26.8	19.5	19.5	25.4	25.4	20.3
(3)	(2)	(2)	(2)	(2)	(2)

#### **4.10. Replacement of Aging Infrastructure**

In Appendix B of the December 17, 2015 Order Finding Transmission Needs Driven by Public Policy Requirements, the NYPSC stated: "The selection process for transmission solutions shall favor transmission solutions that result in upgrades to aging infrastructure." The December 17, 2015 PSC Order also states on page 66 *"The Commission hereby finds that having considered the extensive record in these proceedings, it is the public policy of the State of New York and the Public Service Commission: to reduce transmission congestion so that large amounts of power can be transmitted to regions of New York where it is most needed; ..... to avoid refurbishment costs of aging transmission"*. All of the proposed projects include upgrades to aging transmission lines infrastructure. The below sections analyze the transmission lines being decommissioned and replaced by the proposed projects.

##### **4.10.1. Replacement of Aging Infrastructure – Transmission Lines (Segment A)**

The following table is a summary of the transmission line mileages to be replaced for each Segment A proposal. All proposals intend to utilize existing double circuit structures for the first 12.6 miles heading east out of Edic/Porter. These structures are approximately 30 years old. They appear well maintained and in very good physical condition. It would not be prudent to replace those structures at this time. The table below shows that ITC’s proposal T031 and NAT/NYPA’s proposal T027 would replace more miles of existing infrastructure than the other proposals. ITC intends to rebuild the Princetown to New Scotland section of existing circuit #14. NAT/NYPA (T027) proposes to rebuild 6.3 miles of line# 14 from Princetown Junction where the ROW is only 370 feet wide. The replacement of 6.3 miles of lattice structures with single steel pole vertical structure is to accommodate the proposed double circuit 345 kV line.

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### Replacement of Aging Transmission Lines Infrastructure –Segment A

SEGMENT A	CIRCUIT NUMBER	T018 (NGRID/ NY TRANSCO)	T021 (NEXTERA)	T025 (NAT/ NYPA)	T026 (NAT/ NYPA)	T027 (NAT/ NYPA)	T028 (NAT/ NYPA)	T031 (ITC)
Marcy - New Scotland	18	0	0	2.66	0	0	0	0
Prinetown Junction - New Scotland	14 <sup>1</sup>	0	0	0	0	6.3	0	20
<b>Miles of 345 kV Removed</b>		<b>0</b>	<b>0</b>	<b>2.66</b>	<b>0</b>	<b>6.3</b>	<b>0</b>	<b>20</b>
Edic - Prinetown Junction	30 <sup>2</sup>	66.8	66.8	66.8	66.8	66.8	66.8	66.8
Edic - Prinetown Junction	31 <sup>3</sup>	54.2	54.2	54.2	54.2	66.8	54.2	54.2
Prinetown Junction - Rotterdam	30	5	5	5	5	5	5	5
Prinetown Junction - Rotterdam	31	5	5	5	5	5	5	5
<b>Miles of 230 kV Removed</b>		<b>131</b>	<b>131</b>	<b>131</b>	<b>131</b>	<b>143.6</b>	<b>131</b>	<b>131</b>
Prinetown Junction - New Scotland	13 <sup>4</sup>	2.5	2.5	2.5	2.5	13.4	2.5	0
<b>Miles of 115 kV Removed</b>		<b>2.5</b>	<b>2.5</b>	<b>2.5</b>	<b>2.5</b>	<b>13.4</b>	<b>2.5</b>	<b>0</b>
<b>Total Miles of Line Removed</b>		<b>133.5</b>	<b>133.5</b>	<b>136.16</b>	<b>133.5</b>	<b>163.3</b>	<b>133.5</b>	<b>151</b>
<p><sup>1</sup> T027 (NAT/NYPA) proposing to replace 6.3 miles of lattice structure with single pole structure and T031 (ITC) proposing to replace entire 20 miles of lattice structure with single pole double circuit lines.</p> <p><sup>2</sup> All developers are proposing to reuse existing double circuit poles of line #30 to replace existing 230 kV for the first 12.6 miles east out of Edic/Porter. Therefore 12.6 miles of removal shown includes wire, insulators and hardwares only. Removal total 66.8 miles is sum of 12.6miles from NYPA Structures and 54.2 miles of NG Line.</p> <p><sup>3</sup> T027 (NAT/NYPA), double circuit proposal, proposing to reuse existing double circuit poles of line #31 to replace 230 kV for the first 12.6 miles east out of Edic/Porter. Therefore 12.6 miles of removal shown includes wire, insulators and hardwares only. Removal total 66.8 miles is sum from 12.6miles on NYPA Structures and 54.2 miles of NG Line. For rest of the proposals, line#31 from Porter to 12.6 miles is being de-energized, retired in place.</p> <p><sup>4</sup> T027 (NYPA/ NAT), double circuit proposal, 115 kV line#13 from a point 6.3miles South of Prinetown Jct. to Rotterdam Substation, approximately 4.5 miles is being de-energized, retired in place.</p>								

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#### 4.10.2. Replacement of Aging Infrastructure – Substations (Segment A)

- The Segment A proposals predominately affect four existing substations: National Grid’s Edic, New Scotland, Porter and Rotterdam substations. Additionally, NAT/NYPA proposal T025 also affects the NYPA’s Marcy 765 kV station.
- At Edic, NAT/NYPA T025, T026, T027, and T028 are replacing two 345 kV circuit breakers due to loading. At Marcy they are replacing three 345 kV circuit breakers.
- At New Scotland, NGrid proposal T018 proposes to replace the existing R81 and R82 (oil) tie breakers with new SF6 circuit breakers. In addition, the review team identified the need to replace these circuit breakers for NextEra proposal T021 due to physical limitations with proposal T021. None of the remaining proposals replace any existing equipment.
- At Porter, all proposals retire the 230 kV circuit breakers R300, R320 for line #30 and breaker R310 for line #31.
- At Rotterdam, NGrid proposal T018 and the NAT/NYPA proposals T025, T026, T027, and T028 remove the 230 kV yard from service. ITC proposal T031 does not replace any existing equipment. NextEra proposal T021 does not affect or replace any existing equipment at Rotterdam substation.

#### 4.10.3. Replacement of Aging Infrastructure – Transmission Lines (Segment B)

The following table summarizes the transmission line mileage to be replaced by each project for each Segment B proposal. The table below shows that NextEra proposal T022 would replace about 65 less miles of existing infrastructure than the other proposals.

**Transmission Line Replaced For Segment B**

SEGMENT B	CIRCUIT NUMBER	T019 (NGRID/NY TRANSCO)	T022 (NEXTERA)	T023 (NEXTERA)	T029 (NYPA/NAT)	T030 (NYPA/NAT)	T032 (ITC)
Knickerbocker - Churchtown	14	21.9	21.9	21.9	21.9	21.9	21.9
Knickerbocker - Churchtown	15	21.9	21.9	21.9	21.9	21.9	21.9
Churchtown - Pleasant Valley	8	32.6	32.6	32.6	32.6	32.6	32.6
Churchtown - Pleasant Valley	10	32.6	32.6	32.6	32.6	32.6	32.6
Churchtown - Pleasant Valley	12	32.6	0	32.6	32.6	32.6	32.6
Churchtown - Pleasant Valley	13	32.6	0	32.6	32.6	32.6	32.6
Blue Stores Tap - Blue Stores	8	2.1	2.1	2.1	2.1	2.1	2.1
<b>Total Miles of 115kV Removed</b>		<b>176.3</b>	<b>111.1</b>	<b>176.3</b>	<b>176.3</b>	<b>176.3</b>	<b>176.3</b>

#### 4.10.4. Replacement of Aging Infrastructure – Substations (Segment A)

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The Segment B proposals predominantly affect NYSEG’s Churchtown substation and Con Ed’s Pleasant Valley substation with minor work at multiple National Grid substations.

- Churchtown Substation
  - National Grid proposal T019 and NAT/NYPA proposals T029 and T030 will replace the existing NYSEG Churchtown 115 kV Substation.
  - NextEra proposals T022 and T023 and ITC proposal T032 retain the existing Churchtown 115 kV Substation.
- No significant aging infrastructure is replaced by any proposal at Pleasant Valley.
- No significant aging infrastructure is replaced by any proposal in the National Grid’s substations.

#### 4.11. General Design Verifications

##### 4.11.1. Substation Design and Arrangements

The review team compared the proposed bus arrangement for the substations proposed by the projects. Below are summary tables of the bus arrangement, number of lines, number of transformers and breakers for each substation.

#### Segment A

##### 4.11.1.1. Edic 345 kV Substation

###### Base Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T018 NGrid/Transco	1	0	1	Breaker & Half	16 (1 new)
T021 NextEra	1	0	1	Breaker & Half	16 (1 new)
T026 NAT/NYPA	1	0	1	Breaker & Half	16 (1 new)
T031 ITC	1	0	1	Breaker & Half	16 (1 new)

#### **Discussion**

The bus arrangements are comparable for all base proposals. A 345 kV breaker is added to Bay #3 to create a new line terminal. All proposals, except proposal T031, shift the 345 kV line to Fraser from Bay #4 to Bay #3 making Bay #4 available for a new 345 kV line. For proposals T018, T021, and T026, the new 345 kV line is to New Scotland. For proposal T031, the new 345 kV line is to the proposed Princetown substation and will terminate in Bay #3.

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**Expandability**

None of the base proposals provide any built-in expandability.

For proposal T027, it should be noted that a potential spare terminal position at Edic (shown on the Developer’s drawings) in the proposed bay north of Bay #1 is already occupied by a 345 kV capacitor bank. Therefore, there is no built-in expandability.

**Replacement of Aging Infrastructure**

NAT/NYPA T026 replaces two 345 kV circuit breakers at Edic due to loading. At Marcy they are replacing three 345 kV circuit breakers. It should be noted that National Grid has an extensive ongoing project to replace the existing control house, protection and control equipment, cabling, conduit and trench system, 345 kV breakers, and 345 kV-115 kV transformers.

**Alternate Proposals**

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T025 NAT/NYPA	1	0	1	Breaker & Half	16 (1 new)
T027 NAT/NYPA	2	0	2	Breaker & Half	18 (3 new)
T028 NAT/NYPA	1	0	1	Breaker & Half	16(1 new)

**Discussion**

Like the base proposals, except for ITC proposal T031, the alternate proposals shift the 345 kV line to Fraser from Bay #4 to Bay #3 making Bay #4 available for a new 345 kV line. For proposal T027, the Developer adds a bay north of Bay #1 for a new 345 kV line to Princetown.

**Expandability**

Like the base proposals, none of the alternate proposals provide any built-in expandability.

**Replacement of Aging Infrastructure**

At Edic, NAT/NYPA T025, T027, and T028 are replacing two 345 kV circuit breakers due to loading. At Marcy they are replacing three 345 kV circuit breakers.

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#### 4.11.1.2. New Scotland 345 kV Substation

##### Base Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T018 NGrid/Transco	1	0	1	Sectionalized Bus (3 sections)	16 (5 new)
T021 NextEra	1	0	1	Sectionalized Bus (3 sections)	16 (3 new)
T026 NAT/NYPA	1	0	1	Sectionalized Bus (3 sections)	16 (3 new)
T031 ITC	1	0	1	Sectionalized Bus (2 sections)	14 (1 new)

#### Discussion

The 345 kV yard at New Scotland has a sectionalized bus. The north main bus is the 99 bus and the south main bus is the 77 bus. The main bus is split by a redundant (back-to-back) tie breaker arrangement, which are breakers R81 and R82.

For all base proposals, one new 345 kV line terminal is added. The Developers place the new line terminal at various locations on the main bus. Proposals T018 and T021 place the new line terminal between tie breakers R81 and R82. Proposals T026 and T031 place the new line terminal on the south main bus (77 bus).

Proposals T018, T021, and T026 increase reliability and operability by adding a second arrangement of redundant tie breakers to further sectionalize the bus creating a third main bus section (88 bus). Proposals T018 and T021 create an 88 bus by adding redundant tie breakers between R81 and R82. Proposal T026 creates an 88 bus by adding redundant tie breakers south of the existing Leeds 93 line terminal.

For proposal T031, a new line terminal is added with no changes to the main bus.

#### Expandability

None of the base proposals provide any built-in expandability.

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### Replacement of Aging Infrastructure

Proposal T018 replaces the existing R81 and R82 (oil) tie circuit breakers with new SF6 breakers. Proposal T021 has the same electrical arrangement as T018, but the Developer does not propose replacing R81 and R82. Based on the review team's field review, these breakers will have to be relocated because there is insufficient room for the proposed arrangement. Thus, from a practical standpoint, R81 and R82 need to be replaced for proposal T021.

Proposals T026 and T031 do not replace any existing equipment.

### Alternate Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T025 NAT/NYPA	0	0	0	Sectionalized Bus	13 (0 new)
T027 NAT/NYPA	2	0	2	Sectionalized Bus	17 (4 new)
T028 NAT/NYPA	1	0	1	Sectionalized Bus	16 (3 new)

### Discussion

Proposal T025 does not add any new line terminals or circuit breakers. Proposals T027 and T028 create an 88 bus by adding redundant tie breakers south of the existing Leeds 93 line terminal. For proposal T027, two new 345 kV line terminals are added to the 77 bus. Proposal T028 adds one new line terminal to the 77 bus.

### Expandability

Proposal T025 provides some future expandability by creating one open 345 kV line terminal through the retirement of the 345 kV line to Alps. Proposals T027 and T028 do not provide any built-in expandability.

### Replacement of Aging Infrastructure

None of the alternate proposals replace any existing equipment.

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#### 4.11.1.3. Princetown Substation

##### Base Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T018 NGrid/Transco	No Princetown Substation proposed.				
T021 NextEra	2 – 345 kV 2 – 230 kV	2	6	Breaker & Half	7 – 345 kV 6 – 230 kV
T026 NAT/NYPA	No Princetown Substation proposed.				
T031 ITC	8	0	8	Breaker & Half	12

##### Discussion

For proposals T021 and T031, a breaker-and-a-half configuration is proposed. Proposal T021 has three bays and proposal T031 has four bays. Refer to Risk Analysis section of the report for discussions on the potential issues with siting and constructing the Princetown substation .

##### Expandability

Proposal T021 provides two vacant line terminal positions by adding breakers to complete the breaker-and-a-half configuration. There is also sufficient land available at the proposed site for future expansion.

Proposal T031 does not provide any built-in expandability.

##### Replacement of Aging Infrastructure

There is no replacement of aging infrastructure, as Princetown would be a new substation on a greenfield site.

##### Alternate Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T025 NAT/NYPA	4	0	4	Ring Bus	4
T027 NAT/NYPA	6	0	6	Breaker & Half	9
T028 NAT/NYPA	4	0	4	Ring Bus	4

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### Discussion

For alternate proposals T025 and T028, a four-breaker ring-bus configuration is proposed. For alternate proposal T027, NAT/NYPA propose a gas-insulated three-bay breaker-and-a-half configuration. Refer to Risk Analysis section of the report for discussions on the potential issues with siting and constructing the Princetown substation.

### Expandability

None of the proposals provide any built-in expandability.

### Replacement of Aging Infrastructure

There is no replacement of aging infrastructure, as Princetown would be a new substation on a greenfield site.

#### 4.11.1.4. Rotterdam Substation

#### Base Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T018 NGrid/Transco	2 – 345 kV 1 – 230 kV 2 – 115 kV*	1 – 345 kV-230 kV 2 – 345 kV-115 kV	8	Breaker & Half (Gas-Insulated)	9 – 345 kV 1 – 230 kV
T021 NextEra	No changes to Rotterdam proposed.				
T026 NAT/NYPA	2 – 345 kV 1 – 230 kV 2 – 115 kV*	1 – 345 kV-230 kV 2 – 345 kV-115 kV	8	Breaker & Half	8 – 345 kV 1 – 230 kV
T031 ITC	2 – 345 kV	2 – 345 kV-230 kV	4	Sectionalized Bus	3 – 345 kV 1 – 230 kV

\*These are tie lines to the existing 115 kV yard at Rotterdam.

### Discussion

Proposals T018 and T026 propose new 345 kV breaker-and-a-half substations at Rotterdam. These proposals also add two 345 kV-115 kV transformers and one 345 kV-230 kV transformer.

Proposal T031 proposes adding a 345 kV sectionalized bus yard to the north side of the existing Rotterdam 230 kV yard.

Proposal T021 makes no changes to the existing Rotterdam bus arrangement.

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It should be noted that NAT/NYPA proposals T025, T026, T027, and T028 impacts the two existing natural gas transmission pipelines that share the National Grid electric transmission line ROW. During the field review of Rotterdam substation it was identified that the proposed substation layout included in the NAT/NYPA proposals would interfere with existing gas pipelines and the NYISO issued a Request For Information requesting information on how the Developer was proposing to address the issue. The Developer response indicated options to relocate the gas pipelines or move the substation location to the northeast to avoid the pipelines.

NAT/NYPA’s proposal had indicated that the designs were preliminary in nature and expressed willingness to work with the incumbent utility to complete an acceptable design. They stated in their original proposal: *“Rotterdam - the proposal assumes the new 345 kV substation yard will be built in an area to the southwest of the existing 230 kV yard in an area that requires minimal relocation of existing lower voltage transmission lines. The cost of relocation has been included in the estimate. Another alternative considered is building a 345 kV yard on a portion of the existing 230 kV yard. Bidders propose a new location for the Rotterdam 345 yard due to the lower estimated cost, and with the expectation that expanding the 230 kV yard to 345 kV would be much more difficult and require a longer schedule. However, Bidders will be willing to have the incumbent transmission owners build and own the Rotterdam 345 kV substation if necessary to implement the proposal in the most effective and cost efficient manner. Similarly, Gas Insulated Substation (GIS) equipment could be used to greatly reduce the footprint of the Rotterdam 345 kV substation and allow for construction on a smaller footprint on the Rotterdam site, but at a higher cost.”* Since there were viable options to mitigate the concern with the gas pipeline interference and NAT/NYPA had indicated in their proposal a willingness to adapt the design to the incumbent utilities needs the NYISO decided to proceed with the evaluation and include the mitigation costs in the independent cost estimates. Only a small section (length of approximately 1500 feet) of the gas pipelines is affected and can be relocated within existing National Grid property. Thus the risk associated with the relocation was considered to be low. The lines can be relocated to the western edge of National Grid’s property or to the east side of the proposed substation location internal to National Grid’s property. SECo used Kenny Construction, a Division of Granite Construction, for constructability reviews and Kenny had another Granite subsidiary that performs gas pipeline construction review the proposed relocation and pricing. The pipeline was constructed under an Article VII certificate and would be subject to an Article VII modification. Considering the line can be relocated within the National Grid substation site, it was not considered to be a major obstacle. Alternatively, the substation can be moved to the north-east of the proposed location to avoid the gas lines or a GIS station can be constructed in the northern 230kV

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yard that will be abandoned in this project. This should be analyzed in more detail during detailed engineering and licensing in conjunction with the NYSPSC and the incumbent utility. Ultimately, we would expect the PSC to take a holistic approach and decide in the AC Transmission Article VII process the best solution for the gas pipeline and new station location.

ITCs' proposal T031 also impacts one of the gas pipelines and would require a relocation of approximately 900 feet of the pipeline to the western edge within National Grid property and would be located in parallel with the other existing pipeline.

**Expandability**

Both proposals T018 and T026 provide one vacant line terminal position by adding a breaker to complete the breaker-and-a-half configuration. Proposal T031 does not provide any built-in expandability.

**Replacement of Aging Infrastructure**

For proposal T018, the new station replaces the existing north 230 kV yard and allows for the retirement of the south 230 kV yard. This provides an area to potentially reconstruct the 115 kV yard as a full breaker-and-a-half station in the future.

For proposal T026, the new station removes the existing north and south 230 kV yards from service, providing an area to potentially reconstruct the 115 kV yard as a full breaker-and-a-half station in the future.

For proposal T031, all existing 230 kV equipment remains in service. New equipment is added to the existing arrangement.

**Alternate Proposals**

<b>Developer</b>	<b># of new Lines</b>	<b># of new Transformers</b>	<b>Total new elements</b>	<b>Proposed Breaker Arrangement</b>	<b># of Breakers</b>
T025 NAT/NYPA	Same as T026.				
T027 NAT/NYPA	Same as T026.				
T028 NAT/NYPA	Same as T026.				

**Discussion**

No further discussion beyond proposal T026 above.

**Expandability**

No further discussion beyond proposal T026 above.

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### Replacement of Aging Infrastructure

No further discussion beyond proposal T026 above.

#### 4.11.1.5. Remote Terminal Substations

Protection settings and minor equipment changes will be required at remote stations due to system re-configuration. Alps, Marcy, Porter, and Leeds substations are among the substations likely to be affected.

#### 4.11.1.6. Terminal Upgrades

Various terminal upgrades are likely at project related substations and may result in the replacement of some equipment. The scope of work will be determined during the Facilities Study and detailed engineering.

### Segment B

#### 4.11.1.7. Knickerbocker Substation

##### Base Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T019 NGrid/Transco	3	0	3 (also includes Series Compensation)	Ring Bus (built for future Breaker & Half)	3
T022 NextEra	3	0	3	Ring Bus (built for future Breaker & Half)	3
T029 NAT/NYPA	3	0	3	Ring Bus (built for future Breaker & Half)	3
T032 ITC	3 – 345 kV 3 – 115 kV	0	6	345 kV - Ring Bus 115 kV – Ring Bus	3 – 345 kV 3 – 115 kV

### Discussion

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All Developers propose a new Knickerbocker Substation with similar 345 kV ring bus arrangements. Proposal T019 includes Series Compensation on the line terminal to Pleasant Valley. Proposal T032 adds an independent 115 kV ring bus yard.

#### **Expandability**

Proposals T019, T022, and T029 all provide one vacant line terminal position by adding one breaker to the ring bus, or by adding breakers to complete the breaker-and-a-half configuration.

Although proposal T032 does not provide any built-in expandability, ITC's layouts for both the 345 kV and 115 kV yards could easily be modified to provide a vacant line terminal position(s).

#### **Replacement of Aging Infrastructure**

There is no replacement of aging infrastructure, as Knickerbocker would be a new substation on a greenfield site.

#### **Alternate Proposals**

<b>Developer</b>	<b># of new Lines</b>	<b># of new Transformers</b>	<b>Total new elements</b>	<b>Proposed Breaker Arrangement</b>	<b># of Breakers</b>
T023 NextEra	Same as T022.				
T025 NAT/NYPA	1 – 765 kV 2 – 345 kV	2	5	765 kV – Ring Bus 345 kV – Ring Bus	3 – 765 kV 4 – 345 kV
T030 NAT/NYPA	Same as T029.				

#### **Discussion**

Proposal T025 proposes a 765 kV ring bus yard and a 345 kV ring bus yard with two 765 kV – 345 kV transformers. Proposal T025 is a Segment A alternative proposal discussed in this section to keep it's Knickerbocker 765 kV Substation together with other projects' Knickerbocker substation arrangements discussions. Proposal T025 will also require the installation of a new 765 kV breaker and associated equipment at the Marcy Substation.

#### **Expandability**

Proposal T025 does not provide any built-in expandability.

#### **Replacement of Aging Infrastructure**

There is no replacement of aging infrastructure, as Knickerbocker would be a new substation on a greenfield site.

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#### 4.11.1.8. Churchtown Substation

##### Base Proposals.

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T019 NGrid/Transco	5	0	5	Breaker & Half	8
T022 NextEra	5	0	5	Ring Bus (built for future Breaker & Half)	5
T029 NAT/NYPA	5	0	5	Breaker & Half	8
T032 ITC	1	0	1	Straight Bus	4 (1 new)

##### Discussion

Except for proposal T032, all Developers propose constructing a new 115 kV substation at Churchtown. Proposals T019 and T029 will replace the existing NYSEG 115 kV Churchtown Substation. Proposal T022 retains and connects to the existing NYSEG Churchtown Substation.

Proposal T032 adds a line terminal to the existing NYSEG substation.

##### Expandability

Proposals T019 and T029 provide one vacant line terminal position by adding a breaker to complete the breaker-and-a-half configuration.

Proposal T022 provides one vacant line terminal position by adding a breaker to the ring bus.

Proposal T032 does not provide any built-in expandability.

##### Replacement of Aging Infrastructure

National Grid proposal T019 and NAT/NYPA proposal T029 will replace the existing NYSEG Churchtown 115 kV Substation. NextEra proposal T022 and ITC proposal T032 retains the existing Churchtown Substation.

##### Alternate Proposals.

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Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T023 NextEra	4	0	4	Ring Bus (built for future Breaker & Half)	4
T030 NAT/NYPA	Same as T029.				

### Discussion

Similar to proposal T022, proposal T023 retains and connects to the existing NYSEG Churchtown 115 kV substation. It differs from proposal T022 in that it removes one line terminal for the connection to Pleasant Valley substation.

### Expandability

Proposal T023 does not provide any built-in expandability. However, there are provisions for future disconnect switches and breakers to convert the ring bus to a breaker-and-a-half configuration. This will allow a third bay to be added to the north side of the substation.

### Replacement of Aging Infrastructure

NAT/NYPA proposal T030 will replace the existing NYSEG Churchtown substation. NextEra proposal T023 retains the existing Churchtown Substation.

#### 4.11.1.9. Pleasant Valley Substation

##### Base Proposals

Developer	# of new Lines	# of new Transformers	Total new elements	Proposed Breaker Arrangement	# of Breakers
T019 NGrid/Transco	1	0	1 (Also includes (2) capacitor banks)	Breaker & Half	11 (1 new)
T022 NextEra	1	0	1	Breaker & Half	11 (1 new)
T029 NAT/NYPA	1	0	1	Breaker & Half	11 (1 new)
T032 ITC	1	0	1	Breaker & Half	11 (1 new)

### Discussion

Proposals T019, T022 and T029 add a 345 kV breaker to Bay #2 to complete the breaker-and-a-half configuration. This provides a new terminal for relocation of the 345 kV Long Mountain line to Bay #2. The vacant terminal in Bay #3 is then available for the proposed 345 kV line from Knickerbocker. This solution eliminates the new Knickerbocker line crossing the Long Mountain line.

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Similarly, proposal T032 adds a 345 kV breaker to Bay #2 to complete the breaker-and-a-half configuration. The Bay #2 terminal is then available for the proposed 345 kV line from Knickerbocker. This solution makes it necessary for the new Knickerbocker line to cross the Long Mountain line.

**Expandability**

The proposals do not provide any built-in expandability.

**Replacement of Aging Infrastructure**

The proposal does not replace any existing equipment.

**Potential Additional Upgrades Required for Segment B Proposals to Connect to Pleasant Valley 345 kV Substation**

As stated above, all of the proposals for Segment B propose to occupy Bay #2 at the Pleasant Valley Substation. However, based upon the current NYISO interconnection queue, the Cricket Valley Energy Center (CVEC) project—an over 1,000 MW natural gas fired generator located in Dover, New York-- also proposes to interconnect at the Pleasant Valley substation by adding a breaker to Bay #2 completing the breaker-and-a-half configuration.

Currently, the CVEC project is being studied in the NYISO’s 2017 Class Year. In the event that the CVEC project accepts its cost allocation from the 2017 Class Year, the proposed project selected by the NYISO will be required to expand the Pleasant Valley Substation to interconnect. Given that such potential upgrades will be similar across all of the proposals, the cost of these potential upgrades has not been included in the independent cost estimates.

**Alternate Proposals.**

<b>Developer</b>	<b># of new Lines</b>	<b># of new Transformers</b>	<b>Total new elements</b>	<b>Proposed Breaker Arrangement</b>	<b># of Breakers</b>
T023 NextEra	Same as T022.				
T030 NAT/NYPA	Same as T029.				

Discussion, Expandability and Replacement of Aging Equipment: Refer to paragraphs under Base Proposal.

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#### 4.11.1.10. Schodak Substation

Proposals T019, T029 and T030 add 115 kV line breakers. The other proposals do not propose changes at the Schodak substation.

#### 4.11.1.11. Remote Terminal Substations

Protection settings and minor equipment changes will be required at remote substations due to system re-configuration. Greenbush, Milan, Lafarge, North Catskill, Hudson, and Pleasant Valley 115 kV substations are among the substations likely affected.

#### 4.11.1.12. Terminal Upgrades

Various terminal upgrades are likely at project-related substations and may result in the replacement of some equipment. The scope of work will be determined during the Facilities Study and detailed engineering.

### 4.11.2. Transmission Line Design Comparisons

#### 4.11.2.1. Proposed Line Design

The following tables show the Transmission Line Designs proposed by each Developer:

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### Transmission Line Design Information for Segment A Projects

PROPOSAL	DEVELOPER	SECTOR	LINE LENGTH (Miles)	VOLTAGE (KV)	NUMBER OF CIRCUIT	CONDUCTOR		TOTAL STRUCTURE TYPE			COMMENTS
						TYPE	NO/PH	STEEL MONO POLE	STEEL H-POLE	CONCRETE MONO POLE	
T018	National Grid and NYTransco	Edic SS to Princetown Jct	66.8	345	1	954kcmil CARDINAL ACSS	2	45	316		Edic SS to 12.6 miles - 1 Ckt Reconductoring only
		Princetown Jct. to New Scotland SS	19.7	345	1	954kcmil CARDINAL ACSS	2	59	70		2.5 Miles-2 Ckts, 345kV & 115kV Line#13
		Princetown Jct. to Rotterdam SS	5.0	345/345	2	954 kcmil CARDINAL ACSS	2	85			
T021	NextEra	Edic SS to Princetown Jct.	66.8	345	1	1033.5kcmil CURLEW ACSS	2	10		515	Edic SS to 12.6 miles - 1 Ckt Reconductoring only
		Princetown Jct. to New Scotland SS	19.9	345	1	1033.5kcmil CURLEW ACSS	2	7		130	2.5 Miles-2 Ckts, 345kV & 115kV Line#13
		Princetown Jct. to Rotterdam SS	4.2	345/345	2	1033.5kcmil CURLEW ACSS	2	8		72	
		Princetown Jct. to Rotterdam SS	0.8	230/230	2	1033.5kcmil CURLEW ACSS	1	34			
T025	NYPA and NAT	Marcy to Church Rd and New Scotland Bypass	2.7	765	1	1351.5kcmil DIPPER ACSR	4	6	10		Edic SS to 12.6 miles - 1 Ckt Reconductoring only
		Edic SS to Princetown Jct.	66.8	345	1	954kcmil CARDINAL ACSS	2	62	274		2.5 Miles-2 Ckts, 345kV & 115kV Line#13
		Princetown Jct. to New Scotland SS	19.7	345	1	954kcmil CARDINAL ACSS	2	66	61		
		Princetown Jct. to Rotterdam SS	5.0	345/345	2	954kcmil CARDINAL ACSS	2	74			
T026	NYPA and NAT	Edic SS to Princetown Jct.	66.8	345	1	954kcmil CARDINAL ACSS	2	62	274		Edic SS to 12.6 miles - 1 Ckt Reconductoring only
		Princetown Jct. to New Scotland SS	19.7	345	1	954kcmil CARDINAL ACSS	2	66	61		
		Princetown Jct. to Rotterdam SS	5.0	345/345	2	954kcmil CARDINAL ACSS	2	74			
T027	NYPA and NAT	Edic SS to Princetown Jct.	78.6	345/345	2	954kcmil CARDINAL ACSS	2	391			Edic SS to 12.6 miles - 1 Ckt Reconductoring only
		Princetown Jct. to New Scotland SS	19.7	345/345	2	954kcmil CARDINAL ACSS	2	128			2.5 Miles-2 Ckts, 345kV & 115kV Line#13
		Princetown Jct. to New Scotland SS	6.3	345	1	954kcmil CARDINAL ACSS	2	38			
		Princetown Jct. to Rotterdam SS	5.0	345/345	2	954kcmil CARDINAL ACSS	2	74			
T028	NYPA and NAT	Edic SS to Princetown Jct.	66.8	345	1	954kcmil CARDINAL ACSS	2	62	274		Edic SS to 12.6 miles - 1 Ckt Reconductoring only
		Princetown Jct. to New Scotland SS	19.7	345	1	954kcmil CARDINAL ACSS	2	66	61		2.5 Miles-2 Ckts, 345kV & 115kV Line#13
		Princetown Jct. to Rotterdam SS	5.0	345/345	2	954kcmil CARDINAL ACSS	2	74			
T031	ITC	Edic SS to Princetown Jct.	67.2	345	1	954kcmil CARDINAL ACSR	2	42	403		Edic SS to 12.6 miles - 1 Ckt Reconductoring only
		Princetown Jct. to New Scotland SS	19.7	345/345	2	954kcmil CARDINAL ACSR	2	145			
		Princetown Jct. to Rotterdam SS	5.0	345/345	2	954kcmil CARDINAL ACSR	2	8	93		

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### Transmission Line Design Information for Segment B

PROPOSAL	DEVELOPER	SECTOR	LINE LENGTH (Miles)	VOLTAGE (KV)	NUMBER OF CIRCUIT	CONDUCTOR		TOTAL STRUCTURE TYPE			COMMENTS	
						TYPE	NO/PH	STEEL MONO POLE	STEEL H-POLE	CONCRETE MONO POLE		
T019	National Grid and NYTransco	Knickerbocker to Churchtown SS	21.9	115/345	2	954kcmil	CARDINAL ACSS	2	163	7		
		Churchtown SS to Pleasant Valley SS	32.3	115/345	2	954kcmil	CARDINAL ACSS	2	231			
		Blue Stores Jct to Blue Stores SS	2.1	115	1	795kcmil	DRAKE ACSR	1		24		
T022	NextEra	Knickerbocker to Churchtown SS	21.9	115/345	2	1033.5kcmil	CURLEW ACSS	2	14		145	
		Churchtown SS to Pleasant Valley SS	32.3	345	1	1033.5kcmil	CURLEW ACSS	2	17		229	
		Blue Stores Jct to Blue Stores SS	2.1	115	1	795kcmil	DRAKE ACSR	1		24		
T023	NextEra	Knickerbocker to Churchtown SS	21.9	115/345	2	1033.5kcmil	CURLEW ACSS	2	14		145	
		Churchtown SS to Pleasant Valley SS	32.3	115/345	2	1033.5kcmil	CURLEW ACSS	2	21		229	
		Blue Stores Jct to Blue Stores SS	2.1	115	1	795kcmil	DRAKE ACSR	1		24		
T029	NYP&A and NAT	Knickerbocker to Churchtown SS	21.9	115/345	2	954kcmil	CARDINAL ACSS	2	161			
		Churchtown SS to Pleasant Valley SS	32.3	115/345	2	954kcmil	CARDINAL ACSS	2	244			
		Blue Stores Jct to Blue Stores SS	2.1	115	1	795kcmil	DRAKE ACSR	1		24		
T030	NYP&A and NAT	Knickerbocker to Churchtown SS	21.9	115/345	2	477kcmil	HAWK ACSS	3	161			
		Churchtown SS to Pleasant Valley SS	32.3	115/345	2	477kcmil	HAWK ACSS	3	244			
		Blue Stores Jct to Blue Stores SS	2.1	115	1	795kcmil	DRAKE ACSR	1		24		
T032	ITC	Knickerbocker to Churchtown SS	21.9	115/345	2	954kcmil	CARDINAL ACSR	2	158	14		
		Churchtown SS to Pleasant Valley SS	32.1	115/345	3	954kcmil	CARDINAL ACSR	2	19	279		2x115 kV and 1X345kV Circuits
		Blue Stores Jct to Blue Stores SS	2.1	115	1	795kcmil	DRAKE ACSR	1		24		

#### 4.11.2.2. Proposed ROW

All of the transmission line proposals were evaluated to verify that they adequately fit within existing ROW corridors. The evaluation was based on conductor swingout using maximum blow out at 6 psf wind, maximum deflection and electrical clearance requirements. All proposals were found to be adequate.

#### 4.11.2.3. Clearances

Electrical clearance to ground was checked to ensure compliance with NESC requirements. All proposed designs exceed NESC minimum clearances with a two to three foot margin. Including at least a two foot additional buffer in the design is good utility practice for construction tolerances and survey adjustments/errors.

#### 4.11.2.4. EMF

NY State Public Service Commission policy limits the electrical and magnetic fields produced by a transmission line. The maximum limits at the edge of the right of way for the electrical field is 1.6

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kilovolts per meter (kV/m)<sup>4</sup> and for the magnetic field is 200 milligauss (mG)<sup>5</sup>. The existing transmission line corridor (345 kV Lines #14 and #18, and 115 kV Line #13 are located in that corridor) between Princetown Junction and New Scotland Substation is currently estimated to exceed NYPSC standards for EMF levels. The designs for proposals T018, T021, T026, T027 and T028 improve the EMF exceedance condition, but EMF levels are still estimated to exceed the standards. Although the proposed designs may actually improve existing levels on this transmission corridor, current NYPSC Article VII regulations require that any project proposing upgrades on the corridor will need to correct the exceedance to comply with current standards. Calculations provided by the Developers are preliminary in nature and will have to be confirmed during detailed engineering design. The findings might result in purchasing of new EMF easements from property owners along the ROW between Princetown and New Scotland.

Additionally, proposal T025 proposed conversion of the 345 kV line between Marcy substation and the proposed Knickerbocker Substation to 765 kV, will likely increase EMF levels beyond NYPSC standards and would also require acquisition of additional easements.

The study originally provided by the Developer for the double circuit 345 kV line construction for Proposal T027 indicated the design would mitigate the EMF exceedance. After further review by the Developer and an independent study by SECo it was concluded that the design would exceed NYS PSC guidelines.

It should be noted that SECo did not perform independent EMF calculations with the exception of T027. Developers provided calculations that were checked for their reasonableness within the context of the PSC EMF standards. The calculations provided by all Developers have a reasonable correlation to one another for similar arrangements and appear to be a good preliminary indication of the potential EMF levels. The additional ROW requirements shown in this report are estimates based on information provided by the Developers and subject to round off and preliminary nature of the design. The exact ROW requirements will need to be determined once the final design is complete. An allowance was included in the independent cost estimate to allow for the purchase of additional easements associated with EMF mitigation.

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<sup>4</sup> The applicable electric field strength standards established by the PSC are set forth in Opinion No. 78-13 (issued June 19, 1978).

<sup>5</sup> The magnetic field standards established by the PSC are set forth in the PSC's Interim Policy Statement on Magnetic Fields, issued September 11, 1990. This statement also reaffirmed the electric field strength standards set in Opinion No. 78-13.

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The following table summarizes the EMF results provided by the developers and the estimated additional ROW that is likely to be required to mitigate the EMF levels. The values included for T027 are based on revised corrected results submitted by the Developer in June 2018 and verified by an independent study.

**EMF Results Provided by the Developers and Estimated Additional ROW**

PROPOSAL	Developer	LINE				EMF			
		Sector	Voltage (kV)	Length (miles)	Corridor Width (ft.)	Estimated @ Edge of ROW		Estimated Additional ROW Requirement	
						Max. Electric Field (kV/m)	Max. Magnetic Field (mG)	Width (ft.)	Area (Acres)
T018	National Grid and NYTransco	Princeton Jct. to New Scotland SS	345	6.3	370	1.9	94.6	10	7.6
			345	4.3	590	1.9	59.2	10	5.2
			345/115	2.5	450	1.9	83.4	10	3.0
			345	6.6	590	1.9	59.2	10	8.0
			19.7					23.9	
T021	NextEra Energy	Princeton Jct. to New Scotland SS	345	6.5	370	1.7	140.0	10	7.9
			345	4.3	590	1.8	150.0	10	5.2
			345/115	2.5	450	1.8	150.0	10	3.0
			345	6.6	590	1.8	170.0	10	8.0
			19.9					24.1	
T025	NYPA / NAT	Marcy SS to Knickerbocker	765	0.4	470	0.3	50.0		0.0
			765	1.3	675	2.7	125.0	25	4.0
			765	33.7	360-380	Not Provided		23	93.8
			765	2.0	570	2.6	161.0	23	5.5
			765	27.7	345-380	Not Provided		23	77.2
			765	6.3	370	2.7	212.0	25	19.1
			765	4.3	590	2.6	148.0	23	11.9
			765	2.5	450	2.7	188.0	25	7.6
			765	6.1	590	2.6	148.0	23	17.1
			765	1.0	615	1.4	119.0		0.0
			765	1.9	615	0.2	27.0		0.0
			765	1.1	400	0.5	232.0		0.0
			765	1.5	400	1.9	100.0	9	1.6
			765	5.1	250	1.7	92.0	8	5.0
765	3.0	750	0.4	187.0		0.0			
			97.9				242.9		
T026 & T028	NYPA / NAT	Princeton Jct. to New Scotland SS	345	6.3	370	1.8	208.0	10	7.6
			345	4.3	590	1.9	150.0	10	5.2
			345/115	2.5	450	1.9	188.0	10	3.0
			345	6.6	590	1.8	185.0	10	8.0
			19.7				23.9		
T027	NYPA / NAT	Princeton Jct. to New Scotland SS	345	6.3	370	1.2	113.0		0.0
			345	4.3	590	1.8	162.0	10	5.2
			345	2.5	450	1.8	155.0	10	3.0
			345	6.6	590	1.8	162.0	10	8.0
			19.7				16.2		
T031	ITC	Princeton Jct. to New Scotland SS	345	6.3	370	>1.6	<200	10	7.6
			345	4.3	590	Not Provided		10	5.2
			345/115	2.5	450	Not Provided		10	3.0
			345	6.6	590	Not Provided		10	8.0
			19.7				23.9		

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#### 4.11.2.5. Transmission Line Conductor Ampacity Ratings

The following tables show a summary of the proposed line lengths, conductor types and conductor ratings for each proposal. No concerns were identified with the proposed conductor types and sizes.

**Segment A Transmission Line Conductor Ampacity Ratings**

Segment A							SECO CALCULATED			
PROPOSAL	DEVELOPER	SECTOR	Line Length (Miles)	VOLTAGE (KV)	NUMBER OF LINE	CONDUCTOR		STEADY STATE THERMAL RATING (AMPS)	CONDUCTOR RATING (MVA)	
						TYPE	NO/PH			
T018	National Grid and NYTransco	Edic SS to Rotterdam SS	71.8	345	1	954kcmil	CARDINAL ACSS	2	4072.8	2433.7
		Edic SS to New Scotland SS	86.5	345	1	954kcmil	CARDINAL ACSS	2	4072.8	2433.7
		Rotterdam SS to New Scotland SS	24.7	345	1	954kcmil	CARDINAL ACSS	2	4072.8	2433.7
T021	NextEra	Edic SS to Princetown SS	71.0	345	1	1033.5kcmil	CURLEW ACSS	2	4293.2	2565.4
		Edic SS to New Scotland SS	86.7	345	1	1033.5kcmil	CURLEW ACSS	2	4293.2	2565.4
		Princetown SS to Rotterdam SS	0.8	230	1	1033.5kcmil	CURLEW ACSS	1	2147.0	855.3
		Princetown SS to Rotterdam SS #2	0.8	230	1	1033.5kcmil	CURLEW ACSS	1	2147.0	855.3
T025	NYPA and NAT	Edic SS to Rotterdam SS	71.8	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Edic SS to New Scotland SS	86.5	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Rotterdam SS to New Scotland SS	24.7	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Marcy to New Scotland SS	85.7	765	1	1351.5kcmil	DIPPER ACSR	4	3210.0	4253.3
T026 & T028	NYPA and NAT	Edic SS to Rotterdam SS	71.8	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Edic SS to New Scotland SS	86.5	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Rotterdam SS to New Scotland SS	24.7	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
T027	NYPA and NAT	Edic SS to Rotterdam SS	71.8	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Edic SS to New Scotland SS	86.5	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Edic SS to New Scotland SS #2	86.5	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
		Rotterdam SS to New Scotland SS	24.7	345	1	954kcmil	CARDINAL ACSS	2	3678.2	2197.9
T031	ITC	Edic SS to Rotterdam SS	72.2	345	1	954kcmil	CARDINAL ACSR	2	3162.0	1889.5
		Edic SS to New Scotland SS	86.9	345	1	954kcmil	CARDINAL ACSR	2	3162.0	1889.5
		Rotterdam SS to New Scotland SS	24.7	345	1	954kcmil	CARDINAL ACSR	2	3162.0	1889.5

Results based on Conductor Maximum temperature and Ambient temperature as shown in table above, Absorptivity and Emissivity 0.6 and Wind 3 ft/sec.

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### Segment B Transmission Line Conductor Ampacity Ratings

Segment B							SECO CALCULATED			
PROPOSAL	DEVELOPER	SECTOR	Line Length (Miles)	VOLTAGE (KV)	NUMBER OF LINE	CONDUCTOR		STEADY STATE THERMAL RATING (AMPS)	CONDUCTOR RATING (MVA)	
						TYPE	NO/PH			
T019	National Grid and NYTransco	Knickerbocker to Pleasant Valley	54.2	345	1	954kcmil	CARDINAL ACSS	2	3910.0	2336.4
		Knickerbocker to Pleasant Valley	54.2	115	1	954kcmil	CARDINAL ACSS	1	1955.0	389.4
		Blue Stores Jct to Blue Stores SS	2.1	115	1	795kcmil	DRAKE ACSR	1	1364.5	271.8
T022	NextEra	Knickerbocker to Pleasant Valley	54.2	345	1	1033.5	CURLEW ACSS	2	3440.0	2055.6
		Knickerbocker to Churchtown	21.9	115	1	795kcmil	DRAKE ACSS	1	1495.0	297.8
T023	NextEra	Knickerbocker to Pleasant Valley	54.2	345	1	1033.5	CURLEW ACSS	2	3440.0	2055.6
		Knickerbocker to Pleasant Valley	54.2	115	1	795kcmil	DRAKE ACSS	1	1495.0	297.8
T029	NYPA and NAT	Knickerbocker to Pleasant Valley	54.2	345	1	954kcmil	CARDINAL ACSS	2	3882.8	2320.2
		Knickerbocker to Pleasant Valley	54.2	115	1	954kcmil	CARDINAL ACSS	1	1941.4	386.7
T030	NYPA and NAT	Knickerbocker to Pleasant Valley	54.2	345	1	477kcmil	HAWK ACSS	3	4195.8	2507.2
		Knickerbocker to Pleasant Valley	54.2	115	1	954kcmil	CARDINAL ACSS	1	2126.1	423.5
T032	ITC	Knickerbocker to Pleasant Valley	54.0	345	1	954kcmil	CARDINAL ACSR	2	3162.0	1889.5
		Knickerbocker to Pleasant Valley	54.0	115	1	954kcmil	CARDINAL ACSR	1	1581.0	314.9
		Churchtown to Pleasant Valley	32.1	115	1	954kcmil	CARDINAL ACSR	1	1581.0	314.9

Results based on Conductor Maximum temperature and Ambient temperature as shown in table above, Absorptivity and Emissivity 0.6 and Wind 3 ft/s

#### 4.11.2.6. Structure Heights

Tables summarizing the structure height increase for each proposal is shown in the Environmental Section 4.9. The heights were derived from each Developers proposed designs and PLSCadd models provided.

#### 4.11.2.7. Structural Design Criteria

The transmission line structural design criteria were evaluated for all of the proposals. The following table summarizes the criteria used. All proposals meet minimum standards as defined by the 2017 version of the National Electric Safety Code Section 25 for this region of the country and are within the guidelines of the Third Edition of ASCE's Manual 74 "Guidelines for Electrical Transmission Line Structural Loading".

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**DESIGN CRITERIA REQUIREMENT COMPARISON FOR THE TRANSMISSION LINE DESIGNS**

Case No.	Case Description	STANDARD REQUIREMENTS				COMPARISON WITH DEVELOPER'S DESIGN CRITERIA			
		Wind Load (mph)	Radial Thickness of ice (inches)	Temp (°F)	Standard	National Grid/ NY Transco	NextEra	NYPA/NAT	ITC
1	NESC Heavy	39.5	0.5	0	NESC – 250B	Ok	Ok	Ok	Ok
2	Extreme Wind <sup>1</sup>	90	0	60	NESC – 250C	Ok <sup>1</sup>	Ok <sup>1</sup>	Exceeds (100MPH)	Exceeds (100MPH)
3	Extreme Ice and Wind	40	0.75	15	NESC – 250D	Ok	Ok	Ok	Ok
4	Extreme Ice				Not Required by NESC or ASCE Loading Guideline 74	1.5" Ice & 2psf Wind (structure overload factor of 1.1)	1.5" Ice & 0psf Wind (structure overload factor of 1.0)	1" Ice & 0psf Wind (structure overload factor of 1.0)	1" Ice & 0psf Wind (structure overload factor of 1.0)

<sup>1</sup> Columbia County & Dutchess County are in the "Special Wind Region" as defined by the NESC. NYPA/NAT & ITC address this by exceeding the requirements of 250C. It is likely that the NESC 250D load case and/or the Extreme Ice case will control the design for National Grid & Nextera which will adequately address any special wind concerns.

The National Grid/Transco proposals T018 and T019 include noticeably heavier duty structures and foundations than other similar proposals. As stated in their proposal, their design “uses significantly heavier ice loadings than required by code and implements several techniques to mitigate cascading structure failures.” Use of these more stringent design criteria does result in higher transmission line structure and foundation costs.

It was also observed that National Grid’s proposal uses more concrete foundations as compared to NAT/NYPA proposals. To ensure that NAT/NYPA were not under designing their foundations, SECo completed a spot check of the NAT/NYPA foundation designs using the geotechnical data that they provided. SECo found that NAT/NYPA’s proposed foundations were adequate.

**4.11.2.8. Potential Issues with Conversion of Line to 765 kV**

A preliminary assessment of the feasibility of the NAT/NYPA 765 KV option, T025 proposal, was completed . The assessment is based on data provided in NAT/NYPA’s proposal and as obtained from Developer and National Grid responses to RFIs. SECo concludes that the conversion of the line is technically feasible. However, as suggested in the NAT/NYPA’s “765 kV Conversion Feasibility Study” document, additional detailed engineering study, survey and field testing must be performed prior to implementation of the project. The review team also believe that the final cost of this conversion may vary widely depending on the potential remedial work recommended as the result of more detailed study. NAT/NYPA have provided rough estimates to indicate possible range of costs.

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The assessment focused on the following technical criteria:

- Condition of Existing Transmission Line – The existing transmission line is approximately 40 years old and has been operated at 345 kV since its construction. Based on visual observation of portions of the line it appears that the line has been well maintained and is in very good physical condition.
- Clearances - NAT/NYPA has obtained Light Detection and Ranging survey (Lidar) data for roughly 1/3 of the existing line length to be converted to 765 kV operation. They state that they have evaluated that data and determined that their proposal will meet current day clearance standards. SECo also reviewed the Lidar data and concurs with NAT/NYPA’s conclusion. SECo has obtained PLSCadd files for the proposed line from NAT/NYPA and found the design line to ground clearance on the line is 44ft. The minimum calculated ground clearance requirement for 765 kV line based on NESC 2012- Rule 232C1a and Table 232-1 is 33.2 feet. The maximum operating temperature of the line as proposed by the Developer will be less than the original design operating temperature of the line. Based on the information put forth by NAT/NYPA and our own evaluation of the partial data received from National Grid, we agree that ground clearance should not be an issue, with the exception of one span between Smith Hill Road and Newport Road. Our independent cost estimate does not include any costs to correct clearance issues.
- Insulation – NAT/NYPA has evaluated the insulation of the existing line and documented their findings in their 765 kV conversion feasibility study report. They show that the insulation level and air gaps are adequate for 765 kV operation and plan to confirm their findings by performing a system transient analysis study. Our independent cost estimate doesn’t include any dollars to correct insulation issues.
- EMF – NAT/NYPA has provided an assessment regarding EMF requirements and has calculated the amount of additional easement required to address EMF needs. Our independent cost estimate includes the cost of the additional easements required to mitigate EMF exceedance.
- Corona – There is concern that corona may likely be an issue with the existing line construction. SECo has contacted a major conductor hardware supplier and learned that some improvements have been made to the corona performance of transmission line hardware since the existing line was constructed. SECo does not have drawings that show the hardware used in the existing construction. Based on photos, taken at several locations throughout the line, it does not appear that the line was constructed with corona rings. Remedial work may be required to correct corona issues on the existing line. A rough cost estimate needed to potentially mitigate corona issues if detailed engineering study confirms the need, was included

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in the cost estimates. The additional cost estimate is to replace hardware (not including insulators) on 83 miles of the existing line and completely rebuild approximately 13-mile of the existing line north of Knickerbocker. The rebuild of the 13 mile section might be required since that section was originally constructed with a bundle of three conductors per phase while the remaining line was constructed with a 4 bundle per phase. These costs have been included as a existing system Network Upgrade Facilities costs in the independent cost estimate.

**4.11.2.9. Use of Concrete Poles**

NextEra proposes to use concrete poles. Due to the length and weight of concrete poles, careful planning during detailed engineering will be required to develop delivery and construction plans for each pole site. NextEra has provided documentation demonstrating that they and the proposed supplier have investigated the logistics of the pole delivery and installations. This investigation includes field reviews, production schedules; as well as delivery methods and routes. In general, the review team determined that the preliminary field review process and planning has considered many of the issues and obstacles that may be confronted during delivery and construction. The Developer’s plan has considered some of the concerns associated with transport, public protection and community impacts. And the option to utilize multi-piece steel poles provides a clear mitigation for problem areas. But as with all project risks, early detection, planning and mitigation are key to avoiding unexpected and untimely schedule and financial impacts. The review team recommends that a more detailed and robust plan and risk mitigation be developed during detailed engineering.

Additionally, the installation of full length concrete poles as opposed to multi-piece steel poles requires significantly more equipment and labor to install. The concrete poles range in length up to 135 feet and weigh up to 62,000 pounds vs. steel pole sections (steel poles typically include three sections) up to 50 feet long and 16,000 pounds. Larger capacity cranes for offloading and setting the poles, heavy duty trucks to move poles on the right of way, larger work pad areas with additional and thicker matting, heavier duty construction access roads with wider turning radius, and additional labor to rig and maneuver the poles is required. These incremental installation costs were considered in the cost estimates.

**4.11.2.10. Operations Concerns**

**4.11.2.10.1. Transmission Line Crossings**

Overhead Transmission line wire crossings could be an area of risk due to the possibility of an upper circuit failing and falling into a lower circuit (or circuits) below.

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- At Edic all Developers, except for ITC, have proposed to relocate the existing Fraser line into a new bay and terminate the new line in the vacated Fraser terminal. ITC (T031) instead terminates the new line into the new terminal and crosses the Fraser line.
- A similar situation applies to the Pleasant Valley substation, where all Developers except ITC propose to relocate the existing Long Mountain line to a new bay allowing the new line to terminate without a crossing.
- At the New Scotland substation, National Grid/Transco and NextEra propose to cross the existing Blenheim Gilboa to New Scotland (Line #672) and New Scotland to Leeds (Line# 686) 345 kV lines to terminate at the New Scotland substation.
  - NextEra proposed design for the 345kV line (T022 and T023) does not have adequate clearance for the crossing of the 115 kV lines from LaFarge to Pleasant Valley and North Catskill to Milan near the Churchtown substation. This should be corrected in final design.

#### 4.11.2.10.2. Triple Circuit Concerns

ITC's Segment B proposal T032 proposes using triple circuit structures between Churchtown Substation and Pleasant Valley Substation. The proposed structures are in a two-pole configuration with one 345 kV circuit attached horizontally to an upper crossarm and two 115 kV circuits attached side by side horizontally to a lower crossarm. The proposed compact design conserves space within the transmission corridor but creates an operational concern. Future maintenance of the transmission circuits and associated structures may depend on the outage availability of all the circuits attached. A maintenance plan must be developed prior to putting this configuration into service.

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## 5. Attachments

### 5.1.Attachment A –Schedule Gantt Charts

### 5.2.Attachment B –Independent Estimates

- 5.2.1.National Grid (NGRID) – (T018)
- 5.2.2.NextEra Energy Transmission New York – (T021)
- 5.2.3.North America Transmission/New York Power Authority (NAT/NYPA) – 765 kV Proposal #1 (T025)
- 5.2.4.North America Transmission/New York Power Authority (NAT/NYPA) – Base Proposal (T026)
- 5.2.5.North America Transmission/New York Power Authority (NAT/NYPA) – Double Circuit (T027)
- 5.2.6.North America Transmission/New York Power Authority (NAT/NYPA) – Enhanced (T028)
- 5.2.7.ITC – (T031)
- 5.2.8.National Grid (NGRID) – (T019)
- 5.2.9.NextEra Energy Transmission New York – (T022)
- 5.2.10. NextEra Energy Transmission New York Alternative – (T023)
- 5.2.11. North America Transmission/New York Power Authority (NAT/NYPA) – Base (T029)
- 5.2.12. North America Transmission/New York Power Authority (NAT/NYPA) – Enhanced (T030)
- 5.2.13. ITC – (T032)

NG NY TRANSCO T018

Task Name	Duration	Year 1										Year 2										Year 3										Year 4																			
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47	M48	M49
<b>NG NY TRANSCO T018</b>	<b>1046 days</b>	[Overall project bar from M-1 to M50]																																																	
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Pre-construction bar from M-1 to M23]																																																	
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Task bar from M1 to M7]																																																	
ARTICLE 7 REVIEW & APPROVAL	260 days	[Task bar from M7 to M19]																																																	
EM&CP REVIEW & APPROVAL	130 days	[Task bar from M19 to M24]																																																	
REAL ESTATE ACQUISITION	520 days	[Task bar from M-1 to M23]																																																	
FINAL ENGINEERING	391 days	[Task bar from M7 to M24]																																																	
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Task bar from M7 to M24]																																																	
<b>TRANSMISSION LINE - EDIC TO NEW SCOTLAND</b>	<b>523 days</b>	[Transmission line bar from M24 to M50]																																																	
PRINCETOWN TO ROTTERDAM LINE 31 REBUILD	65 days	[Task bar from M24 to M25]																																																	
PRINCETOWN TO ROTTERDAM LINE 30 REBUILD	66 days	[Task bar from M32 to M33]																																																	
EDIC TO PRINCETOWN	383 days	[Task bar from M32 to M50]																																																	
PRINCETOWN TO NEW SCOTLAND - XS 11, 13	81 days	[Task bar from M37 to M38]																																																	
PRINCETOWN TO NEW SCOTLAND - XS 10	31 days	[Task bar from M41 to M42]																																																	
PRINCETOWN TO NEW SCOTLAND - XS 1,4	88 days	[Task bar from M44 to M45]																																																	
<b>SUBSTATIONS - EDIC TO NEW SCOTLAND</b>	<b>324 days</b>	[Substations bar from M24 to M37]																																																	
EDIC SUBSTATION	129 days	[Task bar from M24 to M25]																																																	
ROTTERDAM SUBSTATION	324 days	[Task bar from M24 to M37]																																																	
NEW SCOTLAND SUBSTATION	129 days	[Task bar from M24 to M25]																																																	
<b>T018 COMPLETE</b>	<b>1 day</b>	[Completion point at M50]																																																	

NEXTERA T021

Task Name	Duration	Year 1												Year 2												Year 3												Year 4											
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47
<b>NEXTERA T021</b>	<b>1046 days</b>	[Overall project bar]																																															
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Pre-construction bar]																																															
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Task bar]																																															
ARTICLE 7 REVIEW & APPROVAL	260 days	[Task bar]																																															
EM&CP REVIEW & APPROVAL	130 days	[Task bar]																																															
REAL ESTATE ACQUISITION	520 days	[Task bar]																																															
FINAL ENGINEERING	391 days	[Task bar]																																															
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Task bar]																																															
<b>TRANSMISSION LINE - EDIC TO NEW SCOTLAND</b>	<b>523 days</b>	[Transmission line bar]																																															
PRINCETOWN TO ROTTERDAM (Line 31)	65 days	[Task bar]																																															
PRINCETOWN TO ROTTERDAM (Line 30)	66 days	[Task bar]																																															
EDIC TO PRINCETOWN	383 days	[Task bar]																																															
PRINCETOWN TO NEW SCOTLAND	228 days	[Task bar]																																															
<b>SUBSTATIONS - EDIC TO NEW SCOTLAND</b>	<b>324 days</b>	[Substations bar]																																															
EDIC SUBSTATION	129 days	[Task bar]																																															
PRINCETOWN SUBSTATION	324 days	[Task bar]																																															
NEW SCOTLAND SUBSTATION	129 days	[Task bar]																																															
<b>T021 COMPLETE</b>	<b>1 day</b>	[Completion point]																																															

**NYPA NAT T025**

Task Name	Duration	Year 1												Year 2												Year 3												Year 4															
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47	M48	M49	M50	M51
<b>NYPA NAT T025</b>	<b>1089 days</b>	[Overall Project Duration Bar]																																																			
<b>PRE-CONSTRUCTION</b>	<b>563 days</b>	[Pre-construction Duration Bar]																																																			
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Task Bar]																																																			
ARTICLE 7 REVIEW & APPROVAL	281 days	[Task Bar]																																																			
EM&CP REVIEW & APPROVAL	152 days	[Task Bar]																																																			
REAL ESTATE ACQUISITION	563 days	[Task Bar]																																																			
FINAL ENGINEERING	433 days	[Task Bar]																																																			
PROCURE MAJOR EQUIPMENT & MATERIALS	433 days	[Task Bar]																																																			
<b>TRANSMISSION LINE - EDIC TO NEW SCOTLAND</b>	<b>522 days</b>	[Transmission Line Duration Bar]																																																			
PRINCETOWN TO ROTTERDAM Line 31 Rebuild	65 days	[Task Bar]																																																			
PRINCETOWN TO ROTTERDAM Line 30 Rebuild	66 days	[Task Bar]																																																			
EDIC TO PRINCETOWN	383 days	[Task Bar]																																																			
MARCY TO EDIC 765kV REBUILD	68 days	[Task Bar]																																																			
NEW SCOTLAND 765kV REBUILD	68 days	[Task Bar]																																																			
PRINCETOWN TO NEW SCOTLAND	219 days	[Task Bar]																																																			
<b>SUBSTATIONS - EDIC TO NEW SCOTLAND</b>	<b>455 days</b>	[Substations Duration Bar]																																																			
EDIC SUBSTATION	129 days	[Task Bar]																																																			
KNICKERBOCKER SUBSTATION	324 days	[Task Bar]																																																			
PRINCETOWN SUBSTATION	324 days	[Task Bar]																																																			
NEW SCOTLAND SUBSTATION	129 days	[Task Bar]																																																			
MARCY SUBSTATION	90 days	[Task Bar]																																																			
<b>T025 COMPLETE</b>	<b>1 day</b>	[Completion Point]																																																			

**NYPA NAT T026**

Task Name	Duration	Year 1												Year 2												Year 3												Year 4												
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47	M48
<b>NYPA NAT T026</b>	<b>1046 days</b>	▶																																																
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	▶																																																
ARTICLE 7 PREPARATION & SUBMISSION	130 days	█																																																
ARTICLE 7 REVIEW & APPROVAL	260 days							█																																										
EM&CP REVIEW & APPROVAL	130 days																			█																														
REAL ESTATE ACQUISITION	520 days	█																																																
FINAL ENGINEERING	391 days							█																																										
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days							█																																										
<b>TRANSMISSION LINE - EDIC TO NEW SCOTLAND</b>	<b>523 days</b>																									▶																								
PRINCETOWN TO ROTTERDAM (Line 31 Rebuild)	65 days																									█																								
PRINCETOWN TO ROTTERDAM (Line 30 Rebuild)	66 days																															█																		
EDIC TO PRINCETOWN	383 days																									█																								
PRINCETOWN TO NEW SCOTLAND	228 days																																					█												
<b>SUBSTATIONS - EDIC TO NEW SCOTLAND</b>	<b>324 days</b>																									▶																								
EDIC SUBSTATION	129 days																									█																								
ROTTERDAM SUBSTATION	324 days																									█																								
NEW SCOTLAND SUBSTATION	129 days																									█																								
<b>T026 COMPLETE</b>	<b>1 day</b>																																															◆	<b>3/2</b>	

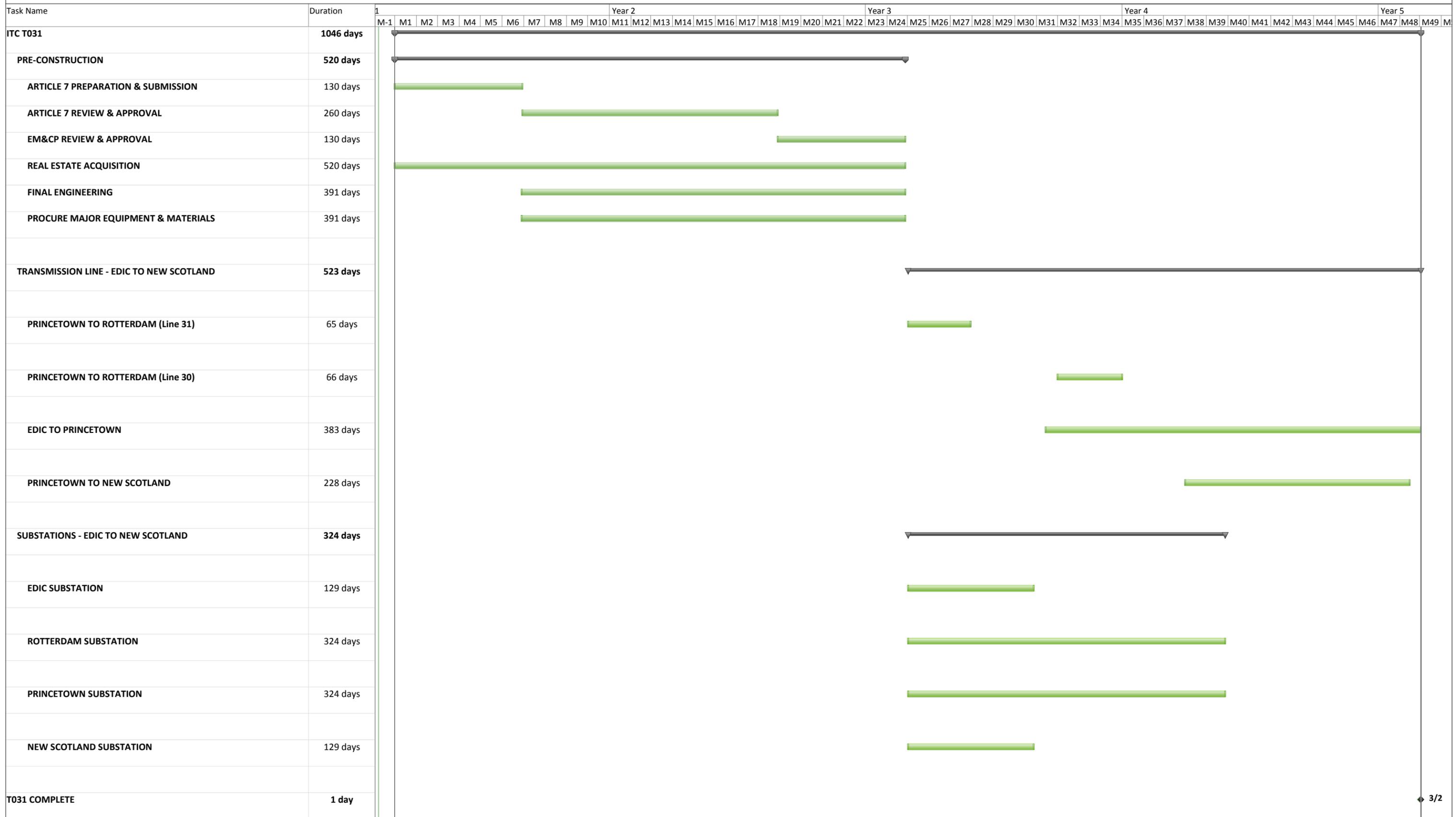
**NYPA NAT T027**

Task Name	Duration	Year 1												Year 2												Year 3												Year 4												Year 5				
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47	M48	M49	M50	M51	M52
<b>NYPA NAT T027</b>	<b>1113 days</b>	[Overall Project Duration Bar]																																																				
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Pre-Construction Duration Bar]																																																				
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Task Bar]																																																				
ARTICLE 7 REVIEW & APPROVAL	260 days	[Task Bar]																																																				
EM&CP REVIEW & APPROVAL	130 days	[Task Bar]																																																				
REAL ESTATE ACQUISITION	520 days	[Task Bar]																																																				
FINAL ENGINEERING	391 days	[Task Bar]																																																				
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Task Bar]																																																				
<b>TRANSMISSION LINE - EDIC TO NEW SCOTLAND</b>	<b>590 days</b>	[Task Bar]																																																				
PRINCETOWN TO ROTTERDAM (Line 31)	65 days	[Task Bar]																																																				
PRINCETOWN TO ROTTERDAM (Line 30)	66 days	[Task Bar]																																																				
EDIC TO PRINCETOWN	383 days	[Task Bar]																																																				
PRINCETOWN TO NEW SCOTLAND	285 days	[Task Bar]																																																				
<b>SUBSTATIONS - EDIC TO NEW SCOTLAND</b>	<b>324 days</b>	[Task Bar]																																																				
EDIC SUBSTATION	129 days	[Task Bar]																																																				
ROTTERDAM SUBSTATION	324 days	[Task Bar]																																																				
PRINCETOWN SUBSTATION	324 days	[Task Bar]																																																				
NEW SCOTLAND SUBSTATION	129 days	[Task Bar]																																																				
<b>T027 COMPLETE</b>	<b>1 day</b>	[Final Day Marker]																																																				

**NYPA NAT T028**

Task Name	Duration	Year 1												Year 2												Year 3												Year 4												
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47	M48
<b>NYPA NAT T028</b>	<b>1046 days</b>	[Overall project bar]																																																
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Pre-construction bar]																																																
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Article 7 bar]																																																
ARTICLE 7 REVIEW & APPROVAL	260 days	[Article 7 Review bar]																																																
EM&CP REVIEW & APPROVAL	130 days	[EM&CP bar]																																																
REAL ESTATE ACQUISITION	520 days	[Real Estate bar]																																																
FINAL ENGINEERING	391 days	[Final Engineering bar]																																																
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Procure bar]																																																
<b>TRANSMISSION LINE - EDIC TO NEW SCOTLAND</b>	<b>523 days</b>	[Transmission Line bar]																																																
PRINCETOWN TO ROTTERDAM (Line 31)	65 days	[Princeton to Rotterdam 31 bar]																																																
PRINCETOWN TO ROTTERDAM (Line 30)	66 days	[Princeton to Rotterdam 30 bar]																																																
EDIC TO PRINCETOWN	383 days	[Edic to Princeton bar]																																																
PRINCETOWN TO NEW SCOTLAND	228 days	[Princeton to New Scotland bar]																																																
<b>SUBSTATIONS - EDIC TO NEW SCOTLAND</b>	<b>324 days</b>	[Substations bar]																																																
EDIC SUBSTATION	129 days	[Edic Substation bar]																																																
ROTTERDAM SUBSTATION	324 days	[Rotterdam Substation bar]																																																
PRINCETOWN SUBSTATION	324 days	[Princeton Substation bar]																																																
NEW SCOTLAND SUBSTATION	129 days	[New Scotland Substation bar]																																																
<b>T028 COMPLETE</b>	<b>1 day</b>	[T028 Complete bar]																																																

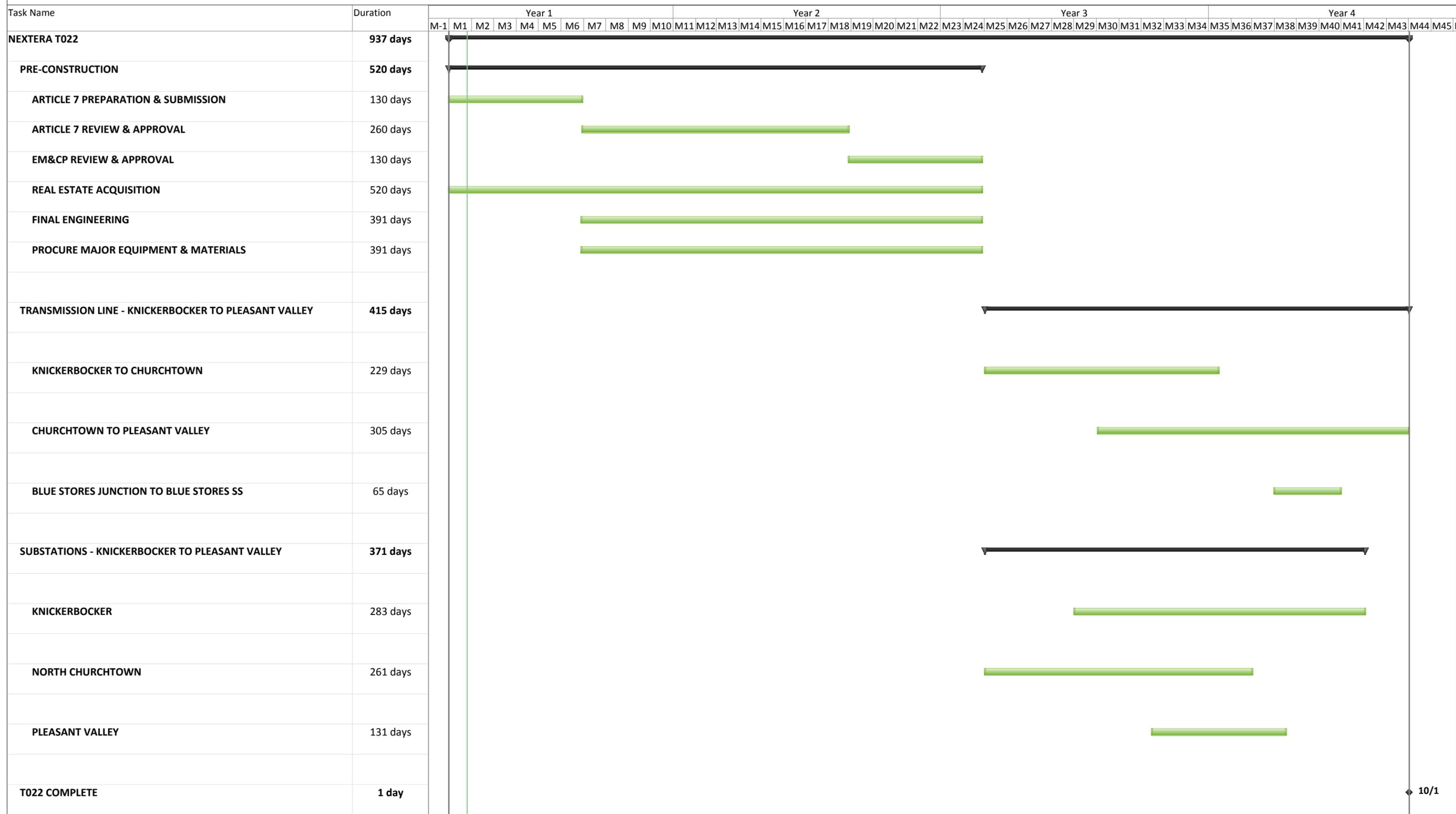
ITC T031



NG NY TRANSCO T019

Task Name	Duration	Year 1										Year 2										Year 3										Year 4															
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45
<b>NG NY TRANSCO T019</b>	<b>980 days</b>	[Overall Project Duration Bar]																																													
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Pre-construction Duration Bar]																																													
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Task Bar]																																													
ARTICLE 7 REVIEW & APPROVAL	260 days	[Task Bar]																																													
EM&CP REVIEW & APPROVAL	130 days	[Task Bar]																																													
REAL ESTATE ACQUISITION	520 days	[Task Bar]																																													
FINAL ENGINEERING	391 days	[Task Bar]																																													
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Task Bar]																																													
<b>TRANSMISSION LINE - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>458 days</b>	[Transmission Line Duration Bar]																																													
KNICKERBOCKER TO CHURCHTOWN	229 days	[Task Bar]																																													
CHURCHTOWN TO PLEASANT VALLEY	348 days	[Task Bar]																																													
BLUE STORES JUNCTION TO BLUE STORES SS	65 days	[Task Bar]																																													
<b>SUBSTATIONS - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>371 days</b>	[Substations Duration Bar]																																													
KNICKERBOCKER SUBSTATION	283 days	[Task Bar]																																													
CHURCHTOWN SUBSTATION	261 days	[Task Bar]																																													
PLEASANT VALLEY SUBSTATION	131 days	[Task Bar]																																													
SCHODACK SUBSTATION	131 days	[Task Bar]																																													
<b>T019 COMPLETE</b>	<b>1 day</b>																																														12/1

NEXTERA T022



NEXTERA T023

Task Name	Duration	Year 1										Year 2										Year 3										Year 4															
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45
<b>NEXTERA T023</b>	<b>979 days</b>	[Gantt bar from M-1 to M47]																																													
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Gantt bar from M-1 to M24]																																													
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Gantt bar from M1 to M6]																																													
ARTICLE 7 REVIEW & APPROVAL	260 days	[Gantt bar from M7 to M16]																																													
EM&CP REVIEW & APPROVAL	130 days	[Gantt bar from M18 to M21]																																													
REAL ESTATE ACQUISITION	520 days	[Gantt bar from M-1 to M24]																																													
FINAL ENGINEERING	391 days	[Gantt bar from M7 to M24]																																													
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Gantt bar from M7 to M24]																																													
TRANSMISSION LINE - KNICKERBOCKER TO PLEASANT VALLEY	<b>457 days</b>	[Gantt bar from M24 to M47]																																													
KNICKERBOCKER TO CHURCHTOWN	229 days	[Gantt bar from M24 to M31]																																													
CHURCHTOWN TO PLEASANT VALLEY	347 days	[Gantt bar from M29 to M47]																																													
BLUE STORES JUNCTION TO BLUE STORES SS	65 days	[Gantt bar from M37 to M38]																																													
SUBSTATIONS - KNICKERBOCKER TO PLEASANT VALLEY	<b>371 days</b>	[Gantt bar from M24 to M41]																																													
KNICKERBOCKER	283 days	[Gantt bar from M29 to M41]																																													
NORTHCHURCHTOWN	261 days	[Gantt bar from M24 to M37]																																													
PLEASANT VALLEY	131 days	[Gantt bar from M32 to M38]																																													
<b>T023 COMPLETE</b>	<b>1 day</b>	[Gantt bar at M47]																																													

11/30

**NYPA NAT T029**

Task Name	Duration	Year 1										Year 2										Year 3										Year 4															
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45
<b>NYPA NAT T029</b>	<b>980 days</b>	[Overall project bar from M-1 to M46]																																													
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Pre-construction bar from M-1 to M22]																																													
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Green bar from M1 to M6]																																													
ARTICLE 7 REVIEW & APPROVAL	260 days	[Green bar from M7 to M12]																																													
EM&CP REVIEW & APPROVAL	130 days	[Green bar from M18 to M21]																																													
REAL ESTATE ACQUISITION	520 days	[Green bar from M-1 to M22]																																													
FINAL ENGINEERING	391 days	[Green bar from M7 to M22]																																													
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Green bar from M7 to M22]																																													
<b>TRANSMISSION LINE - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>458 days</b>	[Transmission line bar from M23 to M46]																																													
KNICKERBOCKER TO CHURCHTOWN	229 days	[Green bar from M23 to M30]																																													
CHURCHTOWN TO PLEASANT VALLEY	348 days	[Green bar from M29 to M46]																																													
BLUE STORES JUNCTION TO BLUE STORES SS	65 days	[Green bar from M37 to M38]																																													
<b>SUBSTATIONS - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>371 days</b>	[Substations bar from M23 to M41]																																													
KNICKERBOCKER	283 days	[Green bar from M29 to M41]																																													
CHURCHTOWN	261 days	[Green bar from M23 to M35]																																													
PLEASANT VALLEY	131 days	[Green bar from M32 to M38]																																													
SCHODACK	131 days	[Green bar from M32 to M38]																																													
<b>T029 COMPLETE</b>	<b>1 day</b>	[Final completion point at M46]																																													

**NYPA NAT T030**

Task Name	Duration	Year 1										Year 2										Year 3										Year 4															
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45
<b>NYPA NAT T030</b>	<b>980 days</b>	[Gantt bar from M-1 to M46]																																													
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Gantt bar from M-1 to M22]																																													
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Green bar from M1 to M6]																																													
ARTICLE 7 REVIEW & APPROVAL	260 days	[Green bar from M7 to M12]																																													
EM&CP REVIEW & APPROVAL	130 days	[Green bar from M18 to M21]																																													
REAL ESTATE ACQUISITION	520 days	[Green bar from M-1 to M22]																																													
FINAL ENGINEERING	391 days	[Green bar from M7 to M22]																																													
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Green bar from M7 to M22]																																													
<b>TRANSMISSION LINE - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>458 days</b>	[Gantt bar from M23 to M46]																																													
KNICKERBOCKER TO CHURCHTOWN	229 days	[Green bar from M23 to M30]																																													
CHURCHTOWN TO PLEASANT VALLEY	348 days	[Green bar from M29 to M46]																																													
BLUE STORES JUNCTION TO BLUE STORES SS	65 days	[Green bar from M37 to M38]																																													
<b>SUBSTATIONS - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>371 days</b>	[Gantt bar from M23 to M39]																																													
KNICKERBOCKER	283 days	[Green bar from M29 to M39]																																													
CHURCHTOWN	261 days	[Green bar from M23 to M33]																																													
PLEASANT VALLEY	131 days	[Green bar from M32 to M33]																																													
SCHODACK	131 days	[Green bar from M32 to M33]																																													
<b>T030 COMPLETE</b>	<b>1 day</b>	[Gantt bar at M46]																																													

ITC T032

Task Name	Duration	Year 1												Year 2												Year 3												Year 4											
		M-1	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36	M37	M38	M39	M40	M41	M42	M43	M44	M45	M46	M47
<b>ITC T032</b>	<b>1025 days</b>	[Gantt bar from M-1 to M48]																																															
<b>PRE-CONSTRUCTION</b>	<b>520 days</b>	[Gantt bar from M-1 to M22]																																															
ARTICLE 7 PREPARATION & SUBMISSION	130 days	[Gantt bar from M-1 to M6]																																															
ARTICLE 7 REVIEW & APPROVAL	260 days	[Gantt bar from M7 to M22]																																															
EM&CP REVIEW & APPROVAL	130 days	[Gantt bar from M18 to M27]																																															
REAL ESTATE ACQUISITION	520 days	[Gantt bar from M-1 to M24]																																															
FINAL ENGINEERING	391 days	[Gantt bar from M7 to M24]																																															
PROCURE MAJOR EQUIPMENT & MATERIALS	391 days	[Gantt bar from M7 to M24]																																															
<b>TRANSMISSION LINE - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>503 days</b>	[Gantt bar from M23 to M48]																																															
KNICKERBOCKER TO CHURCHTOWN	229 days	[Gantt bar from M23 to M32]																																															
CHURCHTOWN TO PLEASANT VALLEY	393 days	[Gantt bar from M29 to M48]																																															
BLUE STORES JUNCTION TO BLUE STORES SS	65 days	[Gantt bar from M37 to M39]																																															
<b>SUBSTATIONS - KNICKERBOCKER TO PLEASANT VALLEY</b>	<b>295 days</b>	[Gantt bar from M23 to M37]																																															
KNICKERBOCKER	261 days	[Gantt bar from M23 to M36]																																															
CHURCHTOWN	261 days	[Gantt bar from M23 to M36]																																															
PLEASANT VALLEY	131 days	[Gantt bar from M32 to M39]																																															
<b>T032 COMPLETE</b>	<b>1 day</b>	[Gantt bar at M48]																																															

<b>National Grid and NY Transco (T018)</b>			
<b>Description</b>		<b>Total Amount (In thousand \$)</b>	
<b>Direct Cost</b>	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$52,139
	1.2	Foundations	\$38,037
	1.3	Structures	\$67,033
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$35,990
	1.5	Insulators, Fitting and Hardwares	\$10,840
	Subtotal (1)		<b>\$204,039</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,141
	2.2	Edic Substation	\$2,117
	2.3	Princetown Substation	\$0
	2.4	New Scotland Substation	\$7,037
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,459	
Subtotal (2)		<b>\$66,301</b>	
Total (1+2)		\$270,340	
Contractors Mark-up (15% of Total 1+2)		\$40,551	
Total Direct Cost (A)		<b>\$310,891</b>	
<b>Indirect Cost</b>	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,711
	3.2	Project Management, Material Handling & Amenities	\$18,402
	3.3	Engineering	\$18,121
	3.4	Testing & Commissioning	\$1,559
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$20,144
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,719
Total Indirect Cost (3)		<b>\$77,575</b>	
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$388,466</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	NUF proposed as element of the Project	\$0
	4.2	NUF identified during Evaluation	\$0
<b>Subtotal NUF Cost (C)</b>		<b>\$0</b>	
<b>Total Project Cost (B+C) 2017 \$</b>		<b>\$388,466</b>	
<b>Total Project Cost 2018 \$</b>		<b>\$400,120</b>	

**NG & NY Transco - T018 - (Segment A)**

Estimate Revision: 5

<i>NG &amp; NY Transco - T018 - (Segment A) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Edic to Princetown	\$ 135,362,305
Direct Labor, Material & Equipment Costs	B. Transmission Line Princetown to Rotterdam	\$ 25,485,641
Direct Labor, Material & Equipment Costs	C. Transmission Line Princetown to New Scotland	\$ 43,191,073
Direct Labor, Material & Equipment Costs	D. Rotterdam Substation - Install	\$ 44,530,412
Direct Labor, Material & Equipment Costs	E. Rotterdam Substation - Removal	\$ 3,611,030
Direct Labor, Material & Equipment Costs	F. Edic Substation - Install	\$ 2,081,185
Direct Labor, Material & Equipment Costs	G. Edic Substation - Removal	\$ 35,950
Direct Labor, Material & Equipment Costs	H. New Scotland Substation - Install	\$ 6,878,173
Direct Labor, Material & Equipment Costs	I. New Scotland Substation - Removal	\$ 159,075
Direct Labor, Material & Equipment Costs	J. Porter Substation - Install	\$ 71,912
Direct Labor, Material & Equipment Costs	K. Porter Substation - Removal	\$ 474,313
Direct Labor, Material & Equipment Costs	L. Interconnection Edic Station	\$ 1,784,075
Direct Labor, Material & Equipment Costs	M. Interconnection New Scotland Station	\$ 2,594,271
Direct Labor, Material & Equipment Costs	N. Interconnection Rotterdam Station	\$ 4,080,624
Direct Labor, Material & Equipment Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Direct Labor, Material & Equipment Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ -
<b>SUBTOTAL:</b>		<b>\$ 270,340,040</b>
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		<b>\$ 40,551,006</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>		<b>\$ -</b>
<b>TOTAL DIRECT:</b>		<b>\$ 310,891,046</b>

<i>NG &amp; NY Transco - T018 - (Segment A) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Edic to Princetown	\$ 38,838,802
Indirect Costs	B. Transmission Line Princetown to Rotterdam	\$ 5,423,881
Indirect Costs	C. Transmission Line Princetown to New Scotland	\$ 9,939,957
Indirect Costs	D. Rotterdam Substation - Install	\$ 11,232,064
Indirect Costs	E. Rotterdam Substation - Removal	\$ 585,240
Indirect Costs	F. Edic Substation - Install	\$ 506,194
Indirect Costs	G. Edic Substation - Removal	\$ 5,790
Indirect Costs	H. New Scotland Substation - Install	\$ 1,654,143
Indirect Costs	I. New Scotland Substation - Removal	\$ 25,622
Indirect Costs	J. Porter Substation - Install	\$ 15,157
Indirect Costs	K. Porter Substation - Removal	\$ 83,512
Indirect Costs	L. Interconnection Edic Station	\$ 337,998
Indirect Costs	M. Interconnection New Scotland Station	\$ 506,933
Indirect Costs	N. Interconnection Rotterdam Station	\$ 700,876
Indirect Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Indirect Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ -
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lic. & Permit., and Envir. Mitigation)	\$ 7,718,854
<b>TOTAL INDIRECT:</b>		<b>\$ 77,575,022</b>
<b>TOTAL ESTIMATED COST:</b>		<b>\$ 388,466,068</b>

**NG & NY Transco - T018 - (Segment A)**

**A. Transmission Line Edic to Princetown**

Estimate Revision: **4** Total: \$ **174,201,107**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>A. Transmission Line Edic to Princetown</b>			
1. CLEARING & ACCESS	\$ 41,500	\$ 36,310,876	\$ 36,352,376
2. FOUNDATIONS	\$ 7,516,941	\$ 13,107,490	\$ 20,624,431
3. STRUCTURES	\$ 18,292,102	\$ 27,319,288	\$ 45,611,390
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 4,946,158	\$ 21,045,480	\$ 25,991,638
5. INSULATORS, FITTINGS, HARDWARE	\$ 4,581,500	\$ 2,200,970	\$ 6,782,470
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,830,256	\$ 36,008,546	\$ 38,838,802
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 38,208,458</b>	<b>\$ 135,992,649</b>	<b>\$ 174,201,107</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 38,208,458</b>	<b>\$ 135,992,649</b>	<b>\$ 174,201,107</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Edic to Princetown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	19	Acre	\$ -	\$ -	\$ 15,000	\$ 285,000	\$ 15,000	\$ 285,000
1.2	Clearing the ROW - Light (mowing)	172	Acre	\$ -	\$ -	\$ 5,000	\$ 860,000	\$ 5,000	\$ 860,000
1.3	Permanent Access Road	70,540.8	LF	\$ -	\$ -	\$ 45	\$ 3,174,336	\$ 45	\$ 3,174,336
1.4	Silt Fence	352,704	LF	\$ -	\$ -	\$ 4	\$ 1,410,816	\$ 4	\$ 1,410,816
1.5	Matting - Access and ROW	282,163.2	LF	\$ -	\$ -	\$ 70	\$ 19,751,424	\$ 70	\$ 19,751,424
1.6	Matting - To Work Area	27,075	LF	\$ -	\$ -	\$ 70	\$ 1,895,250	\$ 70	\$ 1,895,250
1.7	Snow Removal	66.8	Mile	\$ -	\$ -	\$ 16,000	\$ 1,068,800	\$ 16,000	\$ 1,068,800
1.8	ROW Restoration	66.8	Mile	\$ -	\$ -	\$ 10,000	\$ 668,000	\$ 10,000	\$ 668,000
1.9	Work Pads	1,805,000	SF	\$ -	\$ -	\$ 4	\$ 6,353,600	\$ 4	\$ 6,353,600
1.10	Restoration for Work Pad areas	361,000	SF	\$ -	\$ -	\$ 0.15	\$ 54,150	\$ 0	\$ 54,150
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	50	EA	\$ -	\$ -	\$ 4,580	\$ 229,000	\$ 4,580	\$ 229,000
1.14	Maintenance and Protection of Traffic on Public Roads	100	EA	\$ -	\$ -	\$ 4,130	\$ 413,000	\$ 4,130	\$ 413,000
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	17	EA	\$ 2,000	\$ 34,000	\$ 2,500	\$ 42,500	\$ 4,500	\$ 76,500
1.17	Concrete Washout Station	50	EA	\$ -	\$ -	\$ 1,850	\$ 92,500	\$ 1,850	\$ 92,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 41,500	\$ 36,310,876	\$ 36,352,376		
<b>2. FOUNDATIONS</b>									
2.1	<i>Direct Embed</i> - 345kV Single Circuit H-Pole Tangent (0-2 degree) 65'-115'	268	Structure	\$ 3,094	\$ 829,125	\$ 21,038	\$ 5,638,050	\$ 24,131	\$ 6,467,175
2.2	<i>Drilled Pier</i> - 345kV Single Circuit H-Pole Angle (15-30 degree)	9	Structure	\$ 94,824	\$ 853,418	\$ 95,840	\$ 862,557	\$ 190,664	\$ 1,715,975
2.3	<i>Drilled Pier</i> - 345kV Single Circuit H-Pole Angle (2-15 degree)	33	Structure	\$ 94,824	\$ 3,129,198	\$ 95,840	\$ 3,162,710	\$ 190,664	\$ 6,291,908
2.4	<i>Drilled Pier</i> - 345kV Single Circuit H-Pole Angle (30-60 degree)	6	Structure	\$ 94,824	\$ 568,945	\$ 95,840	\$ 575,038	\$ 190,664	\$ 1,143,983
2.5	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Angle (2-15 degree)	3	Structure	\$ 79,376	\$ 238,129	\$ 80,226	\$ 240,679	\$ 159,603	\$ 478,808
2.6	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Deadend (15-30 degree)	8	Structure	\$ 100,412	\$ 803,294	\$ 101,487	\$ 811,897	\$ 201,899	\$ 1,615,191
2.7	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Deadend (30-60 degree)	2	Structure	\$ 100,412	\$ 200,823	\$ 101,487	\$ 202,974	\$ 201,899	\$ 403,798
2.8	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Tangent (0-2 degree)	32	Structure	\$ 27,938	\$ 894,010	\$ 28,237	\$ 903,584	\$ 56,175	\$ 1,797,594
2.9									
2.10	Rock Excavation Adder	355	CY	\$ -	\$ -	\$ 2,000	\$ 710,000	\$ 2,000	\$ 710,000
<b>TOTAL - FOUNDATIONS:</b>					\$ 7,516,941	\$ 13,107,490	\$ 20,624,431		
<b>3. STRUCTURES</b>									
3.1	345kV Single Circuit H-Pole Angle (15-30 degree) 60'-90'	9	Structure	\$ 97,613	\$ 878,521	\$ 58,568	\$ 527,112	\$ 156,181	\$ 1,405,633
3.2	345kV Single Circuit H-Pole Angle (2-15 degree) 60'-90'	33	Structure	\$ 97,613	\$ 3,221,242	\$ 58,568	\$ 1,932,745	\$ 156,181	\$ 5,153,988
3.3	345kV Single Circuit H-Pole Angle (30-60 degree) 70'-100'	6	Structure	\$ 98,839	\$ 593,036	\$ 59,304	\$ 355,822	\$ 158,143	\$ 948,858

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
3.4	345kV Single Circuit H-Pole Tangent (0-2 degree) 65'-115'	268	Structure	\$ 39,502	\$ 10,586,586	\$ 23,701	\$ 6,351,952	\$ 63,203	\$ 16,938,538
3.5	345kV Single Circuit Single Pole Angle (2-15 degree) 95'-110'	3	Structure	\$ 82,952	\$ 248,856	\$ 49,771	\$ 149,314	\$ 132,723	\$ 398,170
3.6	345kV Single Circuit Single Pole Deadend (15-30 degree) 115'-155'	8	Structure	\$ 101,691	\$ 813,526	\$ 61,014	\$ 488,116	\$ 162,705	\$ 1,301,642
3.7	345kV Single Circuit Single Pole Deadend (30-60 degree) 140'-145'	2	Structure	\$ 106,098	\$ 212,195	\$ 63,659	\$ 127,317	\$ 169,756	\$ 339,512
3.8	345kV Single Circuit Single Pole Tangent (0-2 degree) 100'-130'	32	Structure	\$ 43,612	\$ 1,395,577	\$ 26,167	\$ 837,346	\$ 69,779	\$ 2,232,923
3.9									
3.10	Remove Existing Foundation	50	EA	\$ -	\$ -	\$ 7,500	\$ 375,000	\$ 7,500	\$ 375,000
3.11	Remove Existing Structure and Accessories	994	EA	\$ -	\$ -	\$ 12,500	\$ 12,425,000	\$ 12,500	\$ 12,425,000
3.12									
3.13									
3.14	Install Grounding and Grounding Accessories	677	Pole	\$ 506	\$ 342,562	\$ 5,539	\$ 3,749,565	\$ 6,045	\$ 4,092,127
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 18,292,102		\$ 27,319,288		\$ 45,611,390
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	2,228,688	LF	\$ 1.90	\$ 4,234,507	\$ 5.00	\$ 11,143,440	\$ 6.90	\$ 15,377,947
4.2	(1) OPGW 36 Fiber AC-33/38/571	301,594	LF	\$ 1.35	\$ 407,152	\$ 5.00	\$ 1,507,970	\$ 6.35	\$ 1,915,122
4.3	(1) 3/8" EHS7 Steel	301,594	LF	\$ 0.47	\$ 141,749	\$ 5.00	\$ 1,507,970	\$ 5.47	\$ 1,649,719
4.4	Remove Existing Conductor and Accessories	121.0	Mile	\$ -	\$ -	\$ 30,000	\$ 3,630,000	\$ 30,000.00	\$ 3,630,000
4.5	Remove Existing OPGW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.6	Remove Existing OHSW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.7	Rider Poles (187 Locations)	93	Set	\$ 1,750	\$ 162,750	\$ 3,500	\$ 325,500	\$ 5,250.00	\$ 488,250
4.8	Rider Poles - Relocated	94	Set	\$ -	\$ -	\$ 3,500	\$ 329,000	\$ 3,500.00	\$ 329,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 4,946,158		\$ 21,045,480		\$ 25,991,638
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,113	Assembly	\$ 1,800	\$ 2,003,400	\$ 720	\$ 801,360	\$ 2,520	\$ 2,804,760
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	375	Assembly	\$ 1,800	\$ 675,000	\$ 720	\$ 270,000	\$ 2,520	\$ 945,000
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	336	Assembly	\$ 200	\$ 67,200	\$ 150	\$ 50,400	\$ 350	\$ 117,600
5.6	OPGW Assembly - Angle / DE	50	Assembly	\$ 250	\$ 12,500	\$ 150	\$ 7,500	\$ 400	\$ 20,000
5.7	OHSW Assembly - Tangent	301	Assembly	\$ 200	\$ 60,200	\$ 150	\$ 45,150	\$ 350	\$ 105,350
5.8	OHSW Assembly - Angle / DE	20	Assembly	\$ 250	\$ 5,000	\$ 150	\$ 3,000	\$ 400	\$ 8,000
5.9	OPGW Splice Boxes	41	Set	\$ 1,746	\$ 71,592	\$ 2,274	\$ 93,234	\$ 4,020	\$ 164,826
5.10	OPGW Splice & Test	41	EA	\$ 2,520	\$ 103,320	\$ 2,520	\$ 103,320	\$ 5,040	\$ 206,640
5.11	Spacer - Conductor	3,593	EA	\$ 50	\$ 179,650	\$ 35	\$ 125,755	\$ 85	\$ 305,405
5.12	Vibration Dampers - Conductor	2,874	EA	\$ 35	\$ 100,590	\$ 35	\$ 100,590	\$ 70	\$ 201,180
5.13	Shield wire / OPGW Dampers, Misc. Fittings	1,356	EA	\$ 27	\$ 36,612	\$ 35	\$ 47,460	\$ 62	\$ 84,072
5.14									
5.15	Replace - Mono Pole Vertical Tangent - V-String	480	Set	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.16	Replace - Dead-end & Angle Insulators	195	Set	\$ 1,800	\$ 351,000	\$ 720	\$ 140,400	\$ 2,520	\$ 491,400
5.17									
5.18	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.19	Misc. materials (Signs and Markers)	66.8	Mile	\$ 770	\$ 51,436	\$ 1,006	\$ 67,201	\$ 1,776	\$ 118,637
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 4,581,500		\$ 2,200,970		\$ 6,782,470
<b>A. Transmission Line Edic to Princetown</b>					\$ 35,378,202		\$ 99,984,104		\$ 135,362,305
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,353,623	\$ 1,353,623	\$ 1,353,623	\$ 1,353,623
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 6,506,866	\$ 6,506,866	\$ 6,506,866	\$ 6,506,866
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,353,623	\$ 1,353,623	\$ 1,353,623	\$ 1,353,623

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,353,623	\$ 1,353,623	\$ 1,353,623	\$ 1,353,623
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 6,768,115	\$ 6,768,115	\$ 6,768,115	\$ 6,768,115
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 406,087	\$ 406,087	\$ 406,087	\$ 406,087
6.7	Geotech	67	Location	\$ -	\$ -	\$ 3,500	\$ 234,500	\$ 3,500	\$ 234,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 947,536	\$ 947,536	\$ 947,536	\$ 947,536
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 406,087	\$ 406,087	\$ 406,087	\$ 406,087
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 7,584,000	\$ 7,584,000	\$ 7,584,000	\$ 7,584,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Compensation for use of 1 Ckt - NYPA Structures (92 Structures)	1	LS	\$ -	\$ -	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123
6.18	Sales Tax on Materials	1	LS	\$ 2,830,256	\$ 2,830,256	\$ -	\$ -	\$ 2,830,256	\$ 2,830,256
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 135,362	\$ 135,362	\$ 135,362	\$ 135,362
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,830,256		\$ 36,008,546		\$ 38,838,802

**NG & NY Transco - T018 - (Segment A)**

**B. Transmission Line Princetown to Rotterdam**

Estimate Revision: **4** Total: \$ **30,909,522**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>B. Transmission Line Princetown to Rotterdam</b>			
1. CLEARING & ACCESS	\$ 6,000	\$ 4,142,200	\$ 4,148,200
2. FOUNDATIONS	\$ 3,178,993	\$ 4,231,038	\$ 7,410,031
3. STRUCTURES	\$ 4,080,173	\$ 4,419,070	\$ 8,499,243
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 773,826	\$ 2,903,455	\$ 3,677,281
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,143,953	\$ 606,933	\$ 1,750,886
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 734,636	\$ 4,689,245	\$ 5,423,881
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 9,917,580	\$ 20,991,942	\$ 30,909,522
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 9,917,580	\$ 20,991,942	\$ 30,909,522

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Princetown to Rotterdam</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	24.0	Acre	\$ -	\$ -	\$ 5,000	\$ 120,000	\$ 5,000	\$ 120,000
1.3	Permanent Access Road	5,280	LF	\$ -	\$ -	\$ 45	\$ 237,600	\$ 45	\$ 237,600
1.4	Silt Fence	26,400	LF	\$ -	\$ -	\$ 4	\$ 105,600	\$ 4	\$ 105,600
1.5	Matting - Access and ROW	21,120	LF	\$ -	\$ -	\$ 70	\$ 1,478,400	\$ 70	\$ 1,478,400
1.6	Matting - To Work Area	6,375	LF	\$ -	\$ -	\$ 70	\$ 446,250	\$ 70	\$ 446,250
1.7	Snow Removal	5.0	Mile	\$ -	\$ -	\$ 16,000	\$ 80,000	\$ 16,000	\$ 80,000
1.8	ROW Restoration	5.0	Mile	\$ -	\$ -	\$ 10,000	\$ 50,000	\$ 10,000	\$ 50,000
1.9	Work Pads	425,000	SF	\$ -	\$ -	\$ 4	\$ 1,496,000	\$ 4	\$ 1,496,000
1.10	Restoration for Work Pad areas	85,000	SF	\$ -	\$ -	\$ 0.2	\$ 12,750	\$ 0	\$ 12,750
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	10	EA	\$ -	\$ -	\$ 4,580	\$ 45,800	\$ 4,580	\$ 45,800
1.14	Maintenance and Protection of Traffic on Public Roads	10	LS	\$ -	\$ -	\$ 4,130	\$ 41,300	\$ 4,130	\$ 41,300
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 6,000		\$ 4,142,200		\$ 4,148,200
<b>2. FOUNDATIONS</b>									
2.1	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Angle	4	Structure	\$ 28,102	\$ 112,409	\$ 28,403	\$ 113,612	\$ 56,505	\$ 226,021
2.2	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Deadend	2	Structure	\$ 79,376	\$ 158,752	\$ 80,226	\$ 160,453	\$ 159,603	\$ 319,205
2.3	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Hvy Angle/DE	22	Structure	\$ 79,376	\$ 1,746,277	\$ 80,226	\$ 1,764,979	\$ 159,603	\$ 3,511,255
2.4	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Tangent Delta	57	Structure	\$ 20,378	\$ 1,161,555	\$ 20,596	\$ 1,173,995	\$ 40,975	\$ 2,335,550
2.5									
2.6									
2.7									
2.8	Rock Excavation Adder	509.0	CY	\$ -	\$ -	\$ 2,000	\$ 1,018,000	\$ 2,000	\$ 1,018,000
<b>TOTAL - FOUNDATIONS:</b>					\$ 3,178,993		\$ 4,231,038		\$ 7,410,031
<b>3. STRUCTURES</b>									
3.1	345kV Single Circuit Single Pole Angle 95'	4	Structure	\$ 40,408	\$ 161,631	\$ 24,245	\$ 96,978	\$ 64,652	\$ 258,609
3.2	345kV Single Circuit Single Pole Deadend 95'	2	Structure	\$ 110,393	\$ 220,786	\$ 66,236	\$ 132,472	\$ 176,629	\$ 353,258
3.3	345kV Single Circuit Single Pole Hvy Angle/DE 90'-95'	22	Structure	\$ 83,034	\$ 1,826,747	\$ 49,820	\$ 1,096,048	\$ 132,854	\$ 2,922,796
3.4	345kV Single Circuit Single Pole Tangent Delta 90'-95'	57	Structure	\$ 32,070	\$ 1,827,998	\$ 19,242	\$ 1,096,799	\$ 51,312	\$ 2,924,797
3.5	Remove Existing Foundation	22	EA	\$ -	\$ -	\$ 7,500	\$ 163,500	\$ 7,500	\$ 163,500

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.6	Remove Existing Structure and Accessories	109	EA	\$ -	\$ -	\$ 12,500	\$ 1,362,500	\$ 12,500	\$ 1,362,500
3.7									
3.8	Install Grounding and Grounding Accessories	85	Pole	\$ 506	\$ 43,010	\$ 5,539	\$ 470,773	\$ 6,045	\$ 513,783
3.9									
3.10									
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 4,080,173		\$ 4,419,070		\$ 8,499,243
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	339,293	LF	\$ 1.90	\$ 644,657	\$ 5.00	\$ 1,696,465	\$ 6.90	\$ 2,341,122
4.2	(1) OPGW 36 Fiber AC-33/38/571	56,549	LF	\$ 1.35	\$ 76,341	\$ 5.00	\$ 282,745	\$ 6.35	\$ 359,086
4.3	(1) 3/8" EHS7 Steel	56,549	LF	\$ 0.47	\$ 26,578	\$ 5.00	\$ 282,745	\$ 5.47	\$ 309,323
4.5	Remove Existing Conductor and Accessories	10.0	Mile	\$ -	\$ -	\$ 30,000	\$ 300,000	\$ 30,000.00	\$ 300,000
4.6	Remove Existing OPGW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.7	Remove Existing OHSW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.8	Rider Poles	15	Set	\$ 1,750	\$ 26,250	\$ 3,500	\$ 52,500	\$ 5,250.00	\$ 78,750
4.9	Rider Poles - Relocated	14	Set	\$ -	\$ -	\$ 3,500	\$ 49,000	\$ 3,500.00	\$ 49,000
4.10									
4.11									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 773,826		\$ 2,903,455		\$ 3,677,281
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	366	Assembly	\$ 1,800	\$ 658,800	\$ 720	\$ 263,520	\$ 2,520	\$ 922,320
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	360	Assembly	\$ 900	\$ 324,000	\$ 560	\$ 201,600	\$ 1,460	\$ 525,600
5.5	OPGW Assembly - Tangent	61	Assembly	\$ 200	\$ 12,200	\$ 150	\$ 9,150	\$ 350	\$ 21,350
5.6	OPGW Assembly - Angle / DE	24	Assembly	\$ 250	\$ 6,000	\$ 150	\$ 3,600	\$ 400	\$ 9,600
5.7	OHSW Assembly - Tangent	61	Assembly	\$ 200	\$ 12,200	\$ 150	\$ 9,150	\$ 350	\$ 21,350
5.8	OHSW Assembly - Angle / DE	24	Assembly	\$ 250	\$ 6,000	\$ 150	\$ 3,600	\$ 400	\$ 9,600
5.9	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,968	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,160
5.10	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.11	Spacer - Conductor	1,038	EA	\$ 50	\$ 51,900	\$ 35	\$ 36,330	\$ 85	\$ 88,230
5.12	Vibration Dampers - Conductor	830	EA	\$ 35	\$ 29,050	\$ 35	\$ 29,050	\$ 70	\$ 58,100
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	210	EA	\$ 27	\$ 5,670	\$ 35	\$ 7,350	\$ 62	\$ 13,020
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	5.2	Mile	\$ 770	\$ 4,004	\$ 1,006	\$ 5,231	\$ 1,776	\$ 9,235
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,143,953		\$ 606,933		\$ 1,750,886
<b>B. Transmission Line Princetown to Rotterdam</b>					\$ 9,182,945		\$ 16,302,697		\$ 25,485,641
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 254,856	\$ 254,856	\$ 254,856	\$ 254,856
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,225,095	\$ 1,225,095	\$ 1,225,095	\$ 1,225,095
6.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 254,856	\$ 254,856	\$ 254,856	\$ 254,856
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 254,856	\$ 254,856	\$ 254,856	\$ 254,856
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,274,282	\$ 1,274,282	\$ 1,274,282	\$ 1,274,282
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 76,457	\$ 76,457	\$ 76,457	\$ 76,457
6.7	Geotech	5	Location	\$ -	\$ -	\$ 3,500	\$ 17,500	\$ 3,500	\$ 17,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 178,399	\$ 178,399	\$ 178,399	\$ 178,399
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 76,457	\$ 76,457	\$ 76,457	\$ 76,457

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 734,636	\$ 734,636	\$ -	\$ -	\$ 734,636	\$ 734,636
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 25,486	\$ 25,486	\$ 25,486	\$ 25,486
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 734,636		\$ 4,689,245		\$ 5,423,881

**NG & NY Transco - T018 - (Segment A)**

**C. Transmission Line Princetown to New Scotland**

Estimate Revision: 5

Total: \$ 53,131,031

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>C. Transmission Line Princetown to New Scotland</b>			
1. CLEARING & ACCESS	\$ 31,000	\$ 11,607,774	\$ 11,638,774
2. FOUNDATIONS	\$ 4,202,127	\$ 5,800,125	\$ 10,002,252
3. STRUCTURES	\$ 7,218,941	\$ 5,703,110	\$ 12,922,050
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 1,564,842	\$ 4,756,290	\$ 6,321,132
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,555,610	\$ 751,255	\$ 2,306,865
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,165,802	\$ 8,774,156	\$ 9,939,957
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 15,738,322</b>	<b>\$ 37,392,709</b>	<b>\$ 53,131,031</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 15,738,322</b>	<b>\$ 37,392,709</b>	<b>\$ 53,131,031</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	54.0	Acre	\$ -	\$ -	\$ 5,000	\$ 270,000	\$ 5,000	\$ 270,000
1.3	Permanent Access Road	20,803	LF	\$ -	\$ -	\$ 45	\$ 936,144	\$ 45	\$ 936,144
1.4	Silt Fence	104,016.0	LF	\$ -	\$ -	\$ 4	\$ 416,064	\$ 4	\$ 416,064
1.5	Matting - Access and ROW	83,213	LF	\$ -	\$ -	\$ 70	\$ 5,824,896	\$ 70	\$ 5,824,896
1.6	Matting - To Work Area	9,675.0	LF	\$ -	\$ -	\$ 70	\$ 677,250	\$ 70	\$ 677,250
1.7	Snow Removal	20	Mile	\$ -	\$ -	\$ 16,000	\$ 315,200	\$ 16,000	\$ 315,200
1.8	ROW Restoration	19.7	Mile	\$ -	\$ -	\$ 10,000	\$ 197,000	\$ 10,000	\$ 197,000
1.9	Work Pads	645,000.0	SF	\$ -	\$ -	\$ 4	\$ 2,270,400	\$ 4	\$ 2,270,400
1.10	Restoration for Work Pad areas	129,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 19,350	\$ 0	\$ 19,350
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	2.0	EA	\$ -	\$ -	\$ 14,445	\$ 28,890	\$ 14,445	\$ 28,890
1.13	Stabilized Construction Entrance	76.0	EA	\$ -	\$ -	\$ 4,580	\$ 348,080	\$ 4,580	\$ 348,080
1.14	Maintenance and Protection of Traffic on Public Roads	50	EA	\$ -	\$ -	\$ 4,130	\$ 206,500	\$ 4,130	\$ 206,500
1.15	Gates	11	EA	\$ 2,000	\$ 22,000	\$ 2,500	\$ 27,500	\$ 4,500	\$ 49,500
1.16	Culverts / Misc. Access	12	EA	\$ 750	\$ 9,000	\$ 1,250	\$ 15,000	\$ 2,000	\$ 24,000
1.17	Concrete Washout Station	30	EA	\$ -	\$ -	\$ 1,850	\$ 55,500	\$ 1,850	\$ 55,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 31,000		\$ 11,607,774		\$ 11,638,774
<b>2. FOUNDATIONS</b>									
2.1	<i>Direct Embed</i> - 345kV Single Circuit H-Pole Tangent (0-2 degree) 65'-115'	56	Structure	\$ 3,094	\$ 173,250	\$ 21,038	\$ 1,178,100	\$ 24,131	\$ 1,351,350
2.2	<i>Drilled Pier</i> - 345kV Double Circuit Single Pole Deadend (0-30 degree)	2	Structure	\$ 124,323	\$ 248,646	\$ 125,655	\$ 251,309	\$ 249,978	\$ 499,956
2.3	<i>Drilled Pier</i> - 345kV Double Circuit Single Pole Tangent (0-2 degree)	15	Structure	\$ 27,856	\$ 417,834	\$ 28,154	\$ 422,309	\$ 56,010	\$ 840,144
2.4	<i>Drilled Pier</i> - 345kV Single Circuit H-Pole Angle (15-30 degree)	3	Structure	\$ 94,824	\$ 284,473	\$ 95,840	\$ 287,519	\$ 190,664	\$ 571,992
2.5	<i>Drilled Pier</i> - 345kV Single Circuit H-Pole Angle (2-15 degree)	6	Structure	\$ 94,824	\$ 568,945	\$ 95,840	\$ 575,038	\$ 190,664	\$ 1,143,983
2.6	<i>Drilled Pier</i> - 345kV Single Circuit H-Pole Angle (30-60 degree)	5	Structure	\$ 94,824	\$ 474,121	\$ 95,840	\$ 479,199	\$ 190,664	\$ 953,319
2.7	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Angle (2-15 degree)	2	Structure	\$ 79,376	\$ 158,752	\$ 80,226	\$ 160,453	\$ 159,603	\$ 319,205
2.8	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Deadend (15-30 degree)	6	Structure	\$ 100,412	\$ 602,470	\$ 101,487	\$ 608,923	\$ 201,899	\$ 1,213,393
2.9	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Deadend (30-60 degree)	2	Structure	\$ 100,412	\$ 200,823	\$ 101,487	\$ 202,974	\$ 201,899	\$ 403,798
2.10	<i>Drilled Pier</i> - 345kV Single Circuit Single Pole Tangent 0 (0-2 degree)	32	Structure	\$ 33,525	\$ 1,072,812	\$ 33,884	\$ 1,084,301	\$ 67,410	\$ 2,157,112
2.11									\$ -
2.12	Rock Excavation Adder	275.0	CY	\$ -	\$ -	\$ 2,000	\$ 550,000	\$ 2,000	\$ 550,000
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 4,202,127		\$ 5,800,125		\$ 10,002,252

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3. STRUCTURES</b>									
3.1	345kV Double Circuit Single Pole Deadend (0-30 degree) 125'-140'	2	Structure	\$ 134,867	\$ 269,734	\$ 80,920	\$ 161,840	\$ 215,787	\$ 431,574
3.2	345kV Double Circuit Single Pole Tangent (0-2 degree) 110'-140'	15	Structure	\$ 48,606	\$ 729,089	\$ 29,164	\$ 437,453	\$ 77,769	\$ 1,166,542
3.3	345kV Single Circuit H-Pole Angle (15-30 degree) 70'-90'	3	Structure	\$ 97,613	\$ 292,840	\$ 58,568	\$ 175,704	\$ 156,181	\$ 468,544
3.4	345kV Single Circuit H-Pole Angle (2-15 degree) 60'-75'	6	Structure	\$ 97,613	\$ 585,680	\$ 58,568	\$ 351,408	\$ 156,181	\$ 937,089
3.5	345kV Single Circuit H-Pole Angle (30-60 degree) 60'-75'	5	Structure	\$ 99,085	\$ 495,423	\$ 59,451	\$ 297,254	\$ 158,535	\$ 792,676
3.6	345kV Single Circuit H-Pole Tangent (0-2 degree) 70'-115'	56	Structure	\$ 39,385	\$ 2,205,587	\$ 23,631	\$ 1,323,352	\$ 63,017	\$ 3,528,939
3.7	345kV Single Circuit Single Pole Angle (2-15 degree) 95'	2	Structure	\$ 82,952	\$ 165,904	\$ 49,771	\$ 99,543	\$ 132,723	\$ 265,447
3.8	345kV Single Circuit Single Pole Deadend (15-30 degree) 115'-150'	6	Structure	\$ 101,691	\$ 610,145	\$ 61,014	\$ 366,087	\$ 162,705	\$ 976,232
3.9	345kV Single Circuit Single Pole Deadend (30-60 degree) 135'-155'	2	Structure	\$ 106,098	\$ 212,195	\$ 63,659	\$ 127,317	\$ 169,756	\$ 339,512
3.10	345kV Single Circuit Single Pole Tangent 0 (0-2 degree) 110'-145'	32	Structure	\$ 48,489	\$ 1,551,651	\$ 29,093	\$ 930,990	\$ 77,583	\$ 2,482,641
3.11	Remove Existing Foundation	4	EA	\$ -	\$ -	\$ 7,500	\$ 30,000	\$ 7,500	\$ 30,000
3.12	Remove Existing Structure and Accessories	24	EA	\$ -	\$ -	\$ 12,500	\$ 300,000	\$ 12,500	\$ 300,000
3.13									
3.14	Install Grounding and Grounding Accessories	199	Pole	\$ 506	\$ 100,694	\$ 5,539	\$ 1,102,162	\$ 6,045	\$ 1,202,856
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 7,218,941		\$ 5,703,110		\$ 12,922,050
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACS "Cardinal"	661,954	LF	\$ 1.90	\$ 1,257,713	\$ 5.00	\$ 3,309,770	\$ 6.90	\$ 4,567,483
4.2	(1) OPGW 36 Fiber AC-33/38/571	110,326	LF	\$ 1.35	\$ 148,940	\$ 5.00	\$ 551,630	\$ 6.35	\$ 700,570
4.3	(1) 3/8" EHS7 Steel	75,398	LF	\$ 0.47	\$ 35,437	\$ 5.00	\$ 376,990	\$ 5.47	\$ 412,427
4.4	115kV - (1) 954kcmil 54/7 ACS "Cardinal"	41,580	LF	\$ 1.90	\$ 79,002	\$ 5.00	\$ 207,900	\$ 6.90	\$ 286,902
4.5	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.6	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.7	Remove Existing Conductor and Accessories	2.5	Mile	\$ -	\$ -	\$ 30,000	\$ 75,000	\$ 30,000.00	\$ 75,000
4.8	Remove Existing OPGW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.9	Remove Existing OHSW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.10	Rider Poles	25	EA	\$ 1,750	\$ 43,750	\$ 3,500	\$ 87,500	\$ 5,250.00	\$ 131,250
4.11	Rider Poles - Relocated	25	Set	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500.00	\$ 87,500
4.12									
4.13									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 1,564,842		\$ 4,756,290		\$ 6,321,132
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	435	Assembly	\$ 1,800	\$ 783,000	\$ 720	\$ 313,200	\$ 2,520	\$ 1,096,200
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	45	Assembly	\$ 900	\$ 40,500	\$ 560	\$ 25,200	\$ 1,460	\$ 65,700
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	270	Assembly	\$ 1,800	\$ 486,000	\$ 720	\$ 194,400	\$ 2,520	\$ 680,400
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	14	Assembly	\$ 900	\$ 12,600	\$ 560	\$ 7,840	\$ 1,460	\$ 20,440
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.7			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.8			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.9			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.10	OPGW Assembly - Tangent	111	Assembly	\$ 200	\$ 22,200	\$ 150	\$ 16,650	\$ 350	\$ 38,850
5.11	OPGW Assembly - Angle / DE	36	Assembly	\$ 250	\$ 9,000	\$ 150	\$ 5,400	\$ 400	\$ 14,400
5.12	OHSW Assembly - Tangent	77	Assembly	\$ 200	\$ 15,400	\$ 150	\$ 11,550	\$ 350	\$ 26,950
5.13	OHSW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.14	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.15	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.16	Spacer - Conductor	1,489	EA	\$ 50	\$ 74,450	\$ 35	\$ 52,115	\$ 85	\$ 126,565
5.17	Vibration Dampers - Conductor	1,192	EA	\$ 35	\$ 41,720	\$ 35	\$ 41,720	\$ 70	\$ 83,440
5.18	Shieldwire / OPGW Dampers, Misc. Fittings	646	EA	\$ 27	\$ 17,442	\$ 35	\$ 22,610	\$ 62	\$ 40,052
5.19	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.20	Misc. materials (Signs and Markers)	19.7	Mile	\$ 770	\$ 15,169	\$ 1,006	\$ 19,818	\$ 1,776	\$ 34,987
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,555,610		\$ 751,255		\$ 2,306,865
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 14,572,520		\$ 28,618,553		\$ 43,191,073
<b>Contractor Mobilization / Demobilization</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 431,911	\$ 431,911	\$ 431,911	\$ 431,911
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,076,195	\$ 2,076,195	\$ 2,076,195	\$ 2,076,195
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 431,911	\$ 431,911	\$ 431,911	\$ 431,911
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 431,911	\$ 431,911	\$ 431,911	\$ 431,911
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,159,554	\$ 2,159,554	\$ 2,159,554	\$ 2,159,554
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 129,573	\$ 129,573	\$ 129,573	\$ 129,573
6.7	Geotech	20	Location	\$ -	\$ -	\$ 3,500	\$ 70,000	\$ 3,500	\$ 70,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 302,338	\$ 302,338	\$ 302,338	\$ 302,338
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 129,573	\$ 129,573	\$ 129,573	\$ 129,573
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 215,000	\$ 215,000	\$ 215,000	\$ 215,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,313,000	\$ 2,313,000	\$ 2,313,000	\$ 2,313,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,165,802	\$ 1,165,802	\$ -	\$ -	\$ 1,165,802	\$ 1,165,802
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 43,191	\$ 43,191	\$ 43,191	\$ 43,191
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,165,802	\$ 43,191	\$ 8,774,156	\$ 9,939,957	\$ 9,939,957

**NG & NY Transco - T018 - (Segment A)**

**D. Rotterdam Substation - Install**

Estimate Revision: **5**

Total: \$ **55,762,476**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>D. Rotterdam Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 189,745	\$ 1,156,225	\$ 1,345,970
2. SUBSTATION FOUNDATIONS	\$ 2,197,240	\$ 2,353,000	\$ 4,550,240
3. SUBSTATION STRUCTURES	\$ 372,220	\$ 372,220	\$ 744,440
4. MAJOR EQUIPMENT	\$ 23,285,000	\$ 6,676,670	\$ 29,961,670
5. SMALL EQUIPMENT / MATERIALS	\$ 1,164,540	\$ 675,000	\$ 1,839,540
6. CONTROL HOUSE / PANELS	\$ 3,396,670	\$ 1,285,545	\$ 4,682,215
7. MISC ITEMS	\$ 532,667	\$ 873,670	\$ 1,406,337
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,491,047	\$ 8,741,017	\$ 11,232,064
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 33,629,129</b>	<b>\$ 22,133,347</b>	<b>\$ 55,762,476</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 33,629,129</b>	<b>\$ 22,133,347</b>	<b>\$ 55,762,476</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Rotterdam Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.25	ACRES	\$ -	\$ -	\$ 230,000	\$ 747,500	\$ 230,000	\$ 747,500
1.2	Station stone within substation fence.	1,385	CY	\$ 27	\$ 37,395	\$ 75	\$ 103,875	\$ 102	\$ 141,270
1.3	Substation Fence	1,310	LF	\$ 100	\$ 131,000	\$ 100	\$ 131,000	\$ 200	\$ 262,000
1.4	Retaining Wall (1065' x 13')	0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.5	Compacted Fill (124,583cy Sand)	0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.6	Permanent Access Road - 20'-Wide	610	LF	\$ 35	\$ 21,350	\$ 285	\$ 173,850	\$ 320	\$ 195,200
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 189,745		\$ 1,156,225		\$ 1,345,970
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kv</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	1	EA	\$ 56,025	\$ 56,025	\$ 60,000	\$ 60,000	\$ 116,025	\$ 116,025
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 26,145	\$ 209,160	\$ 28,000	\$ 224,000	\$ 54,145	\$ 433,160
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	15	EA	\$ 4,482	\$ 67,230	\$ 4,800	\$ 72,000	\$ 9,282	\$ 139,230
2.1j	Instrument Transformer Stand Foundations	18	EA	\$ 4,482	\$ 80,676	\$ 4,800	\$ 86,400	\$ 9,282	\$ 167,076
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564
2.1n	Reactor Foundations	3	EA	\$ 7,470	\$ 22,410	\$ 8,000	\$ 24,000	\$ 15,470	\$ 46,410
2.1p	Transformer Firewalls	3	EA	\$ 65,736	\$ 197,208	\$ 70,400	\$ 211,200	\$ 136,136	\$ 408,408
2.1q									
<b>2.2 230kv</b>									
2.2a	Circuit Breaker Foundations	1	EA	\$ 11,952	\$ 11,952	\$ 12,800	\$ 12,800	\$ 24,752	\$ 24,752
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 22,410	\$ 89,640	\$ 24,000	\$ 96,000	\$ 46,410	\$ 185,640
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	4	EA	\$ 3,735	\$ 14,940	\$ 4,000	\$ 16,000	\$ 7,735	\$ 30,940
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	3	EA	\$ 3,735	\$ 11,205	\$ 4,000	\$ 12,000	\$ 7,735	\$ 23,205
2.2j	Instrument Transformer Stand Foundations	9	EA	\$ 3,735	\$ 33,615	\$ 4,000	\$ 36,000	\$ 7,735	\$ 69,615
2.2k	Arrester Stand Foundations	3	EA	\$ 3,735	\$ 11,205	\$ 4,000	\$ 12,000	\$ 7,735	\$ 23,205
2.2m	Wave Trap Stand Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.4b	345-115kV Transformer Foundation w/ Oil Containment	2	EA	\$ 74,700	\$ 149,400	\$ 80,000	\$ 160,000	\$ 154,700	\$ 309,400
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 862,785	\$ 862,785	\$ 924,000	\$ 924,000	\$ 1,786,785	\$ 1,786,785
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	8	EA	\$ 5,229	\$ 41,832	\$ 5,600	\$ 44,800	\$ 10,829	\$ 86,632
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 2,197,240		\$ 2,353,000		\$ 4,550,240
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345KV</b>								
3.1a	Substation A-Frame Structures - Stand alone	2	EA	\$ 37,000	\$ 74,000	\$ 37,000	\$ 74,000	\$ 74,000	\$ 148,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	15	EA	\$ 3,700	\$ 55,500	\$ 3,700	\$ 55,500	\$ 7,400	\$ 111,000
3.1g	Instrument Transformer Stand	18	EA	\$ 1,850	\$ 33,300	\$ 1,850	\$ 33,300	\$ 3,700	\$ 66,600
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	8	EA	\$ 6,475	\$ 51,800	\$ 6,475	\$ 51,800	\$ 12,950	\$ 103,600

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ 33,300	\$ 33,300	\$ 33,300	\$ 33,300	\$ 66,600	\$ 66,600
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	1	EA	\$ 12,025	\$ 12,025	\$ 12,025	\$ 12,025	\$ 24,050	\$ 24,050
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	3	EA	\$ 2,775	\$ 8,325	\$ 2,775	\$ 8,325	\$ 5,550	\$ 16,650
3.2g	Instrument Transformer Stand	9	EA	\$ 1,295	\$ 11,655	\$ 1,295	\$ 11,655	\$ 2,590	\$ 23,310
3.2h	Arrester Stand	3	EA	\$ 1,295	\$ 3,885	\$ 1,295	\$ 3,885	\$ 2,590	\$ 7,770
3.2j	Wave Trap Stand	1	EA	\$ 5,550	\$ 5,550	\$ 5,550	\$ 5,550	\$ 11,100	\$ 11,100
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>						\$ 372,220	\$ 372,220		\$ 744,440
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200,000	\$ -	\$ 80,000	\$ -	\$ 280,000	\$ -
4.1b	Capacitor Banks with Reactors	1	EA	\$ 370,000	\$ 370,000	\$ 80,000	\$ 80,000	\$ 450,000	\$ 450,000
4.1c	345 kV - 230 kV Auto Transformer	1	EA	\$ 3,700,000	\$ 3,700,000	\$ 750,000	\$ 750,000	\$ 4,450,000	\$ 4,450,000
4.1d	345 kV - 115 kV Auto Transformer	2	EA	\$ 3,200,000	\$ 6,400,000	\$ 750,000	\$ 1,500,000	\$ 3,950,000	\$ 7,900,000
4.1e	345 kV (3) Bay Breaker-and-a-half GIS system with building	1	EA	\$ 12,700,000	\$ 12,700,000	\$ 4,266,670	\$ 4,266,670	\$ 16,966,670	\$ 16,966,670
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	1	EA	\$ 115,000	\$ 115,000	\$ 80,000	\$ 80,000	\$ 195,000	\$ 195,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>						\$ 23,285,000	\$ 6,676,670		\$ 29,961,670
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 12,000	\$ 72,000	\$ 25,000	\$ 150,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1f	Arresters	15	EA	\$ 6,500	\$ 97,500	\$ 1,500	\$ 22,500	\$ 8,000	\$ 120,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	1	EA	\$ 35,000	\$ 35,000	\$ 15,000	\$ 15,000	\$ 50,000	\$ 50,000
5.2b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 30,000	\$ 30,000	\$ 17,500	\$ 17,500	\$ 47,500	\$ 47,500
5.2c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2e	CCVT'S	3	EA	\$ 10,000	\$ 30,000	\$ 6,000	\$ 18,000	\$ 16,000	\$ 48,000
5.2f	Arresters	6	EA	\$ 5,000	\$ 30,000	\$ 6,000	\$ 36,000	\$ 11,000	\$ 66,000
5.2g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	6	EA	\$ 8,000	\$ 48,000	\$ 8,000	\$ 48,000	\$ 16,000	\$ 96,000
5.3f	Arresters	12	EA	\$ 3,420	\$ 41,040	\$ 6,000	\$ 72,000	\$ 9,420	\$ 113,040
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,164,540		\$ 675,000		\$ 1,839,540
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE (70'x135'x22')	1	EA	\$ 1,653,750	\$ 1,653,750	\$ 212,625	\$ 212,625	\$ 1,866,375	\$ 1,866,375
6.2	Protection and Telecom Equipment Panels	30	EA	\$ 35,000	\$ 1,050,000	\$ 10,000	\$ 300,000	\$ 45,000	\$ 1,350,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 227,920	\$ 227,920	\$ 227,920	\$ 227,920	\$ 455,840	\$ 455,840
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 3,396,670		\$ 1,285,545		\$ 4,682,215
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	200	LF	\$ 185.00	\$ 37,000	\$ 170.00	\$ 34,000	\$ 355	\$ 71,000
7.2	Rigid Bus, Fittings & Insulators	100	LF	\$ 125.07	\$ 12,507	\$ 237.10	\$ 23,710	\$ 362	\$ 36,217
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 39.30	\$ -	\$ 53.35	\$ -	\$ 93	\$ -
7.4	Grounding System	12,000	LF	\$ 6.93	\$ 83,160	\$ 32.58	\$ 390,960	\$ 40	\$ 474,120

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
<b>TOTAL - MISC ITEMS</b>					\$ 532,667		\$ 873,670		\$ 1,406,337
<b>D. Rotterdam Substation - Install</b>					\$ 31,138,082		\$ 13,392,330		\$ 44,530,412
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 445,304	\$ 445,304	\$ 445,304	\$ 445,304
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,140,577	\$ 2,140,577	\$ 2,140,577	\$ 2,140,577
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 445,304	\$ 445,304	\$ 445,304	\$ 445,304
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 445,304	\$ 445,304	\$ 445,304	\$ 445,304
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,562,433	\$ 3,562,433	\$ 3,562,433	\$ 3,562,433
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 311,713	\$ 311,713	\$ 311,713	\$ 311,713
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,113,260	\$ 1,113,260	\$ 1,113,260	\$ 1,113,260
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 133,591	\$ 133,591	\$ 133,591	\$ 133,591
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 2,491,047	\$ 2,491,047	\$ -	\$ -	\$ 2,491,047	\$ 2,491,047
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 44,530	\$ 44,530	\$ 44,530	\$ 44,530
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,491,047		\$ 8,741,017		\$ 11,232,064

**NG & NY Transco - T018 - (Segment A)**

**E. Rotterdam Substation - Removal**

Estimate Revision: **5** Total: \$ **4,196,270**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>E. Rotterdam Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 1,472,750	\$ 1,472,750
2. SUBSTATION FOUNDATIONS	\$ -	\$ 617,400	\$ 617,400
3. SUBSTATION STRUCTURES	\$ -	\$ 534,900	\$ 534,900
4. MAJOR EQUIPMENT	\$ -	\$ 147,000	\$ 147,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 169,500	\$ 169,500
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 519,480	\$ 519,480
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 585,240	\$ 585,240
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 4,196,270	\$ 4,196,270
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 4,196,270	\$ 4,196,270

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>E. Rotterdam Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	6.25	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,268,750	\$ 203,000	\$ 1,268,750
1.2	Station stone within substation fence.	2,000	CY	\$ -	\$ -	\$ 102	\$ 204,000	\$ 102	\$ 204,000
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 1,472,750		\$ 1,472,750
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	9	EA	\$ -	\$ -	\$ 7,200	\$ 64,800	\$ 7,200	\$ 64,800
2.2b	Capacitor Bank Foundations	2	EA	\$ -	\$ -	\$ 32,000	\$ 64,000	\$ 32,000	\$ 64,000
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	1	EA	\$ -	\$ -	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	15	EA	\$ -	\$ -	\$ 5,200	\$ 78,000	\$ 5,200	\$ 78,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	4	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	59	EA	\$ -	\$ -	\$ 2,400	\$ 141,600	\$ 2,400	\$ 141,600
2.2j	Instrument Transformer Stand Foundations	15	EA	\$ -	\$ -	\$ 2,400	\$ 36,000	\$ 2,400	\$ 36,000
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	3	EA	\$ -	\$ -	\$ 42,000	\$ 126,000	\$ 42,000	\$ 126,000
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 617,400		\$ 617,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ -	\$ -	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	15	EA	\$ -	\$ -	\$ 9,750	\$ 146,250	\$ 9,750	\$ 146,250
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	4	EA	\$ -	\$ -	\$ 2,250	\$ 9,000	\$ 2,250	\$ 9,000
3.2f	Bus Support 1 Ph	59	EA	\$ -	\$ -	\$ 2,250	\$ 132,750	\$ 2,250	\$ 132,750
3.2g	Instrument Transformer Stand	15	EA	\$ -	\$ -	\$ 1,050	\$ 15,750	\$ 1,050	\$ 15,750

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	3	EA	\$ -	\$ -	\$ 4,500	\$ 13,500	\$ 4,500	\$ 13,500
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 534,900		\$ 534,900
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	9	EA	\$ -	\$ -	\$ 7,000	\$ 63,000	\$ 7,000	\$ 63,000
4.2b	Capacitor Banks	2	EA	\$ -	\$ -	\$ 42,000	\$ 84,000	\$ 42,000	\$ 84,000
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 147,000		\$ 147,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2b	Disconnect Switches - 3ph w/ manual operator	12	EA	\$ -	\$ -	\$ 5,500	\$ 66,000	\$ 5,500	\$ 66,000
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	8	EA	\$ -	\$ -	\$ 1,500	\$ 12,000	\$ 1,500	\$ 12,000
5.2f	Arresters	15	EA	\$ -	\$ -	\$ 2,500	\$ 37,500	\$ 2,500	\$ 37,500
5.2g	Wave Traps	3	EA	\$ -	\$ -	\$ 2,500	\$ 7,500	\$ 2,500	\$ 7,500
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 169,500		\$ 169,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.2	Rigid Bus, Fittings & Insulators	3,200	LF	\$ -	\$ -	\$ 126.25	\$ 404,000	\$ 126	\$ 404,000
7.3	Strain Bus, Connectors & Insulators	800	LF	\$ -	\$ -	\$ 39.35	\$ 31,480	\$ 39	\$ 31,480
7.4	Grounding System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 519,480		\$ 519,480
<b>E. Rotterdam Substation - Removal</b>					\$ -		\$ 3,611,030		\$ 3,611,030
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 173,582	\$ 173,582	\$ 173,582	\$ 173,582
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 288,882	\$ 288,882	\$ 288,882	\$ 288,882
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 25,277	\$ -	\$ 25,277	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 90,276	\$ -	\$ 90,276	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 10,833	\$ 10,833	\$ 10,833	\$ 10,833
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 3,611	\$ 3,611	\$ 3,611	\$ 3,611
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 585,240		\$ 585,240

**NG & NY Transco - T018 - (Segment A)**

**F. Edic Substation - Install**

Estimate Revision: **5**

Total: \$ **2,587,379**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>F. Edic Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,025	\$ 5,625	\$ 7,650
2. SUBSTATION FOUNDATIONS	\$ 100,098	\$ 107,200	\$ 207,298
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 244,000	\$ 133,500	\$ 377,500
6. CONTROL HOUSE / PANELS	\$ 173,850	\$ 98,850	\$ 272,700
7. MISC ITEMS	\$ 339,357	\$ 507,880	\$ 847,237
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 88,298	\$ 417,896	\$ 506,194
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,192,028</b>	<b>\$ 1,395,351</b>	<b>\$ 2,587,379</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,192,028</b>	<b>\$ 1,395,351</b>	<b>\$ 2,587,379</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Edic Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,025		\$ 5,625		\$ 7,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3 115kV</b>									
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 100,098		\$ 107,200		\$ 207,298
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 12,000	\$ 36,000	\$ 25,000	\$ 75,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 30,000	\$ -	\$ 8,000	\$ -	\$ 38,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 28,000	\$ -	\$ 8,000	\$ -	\$ 36,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 244,000		\$ 133,500		\$ 377,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 10,000	\$ 30,000	\$ 45,000	\$ 135,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 68,850	\$ 68,850	\$ 68,850	\$ 68,850	\$ 137,700	\$ 137,700
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 173,850		\$ 98,850		\$ 272,700
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	L.S.	\$ 75,042.00	\$ -	\$ 142,260.00	\$ -	\$ 217,302	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 39.30	\$ 98,250	\$ 53.35	\$ 133,375	\$ 93	\$ 231,625
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 73,305.00	\$ 73,305	\$ 83,700	\$ 83,700
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
<b>TOTAL - MISC ITEMS</b>					\$ 339,357		\$ 507,880		\$ 847,237
<b>F. Edic Substation - Install</b>					\$ 1,103,730		\$ 977,455		\$ 2,081,185
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 20,812	\$ 20,812	\$ 20,812	\$ 20,812
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 100,043	\$ 100,043	\$ 100,043	\$ 100,043
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 20,812	\$ 20,812	\$ 20,812	\$ 20,812
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 20,812	\$ 20,812	\$ 20,812	\$ 20,812
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 166,495	\$ 166,495	\$ 166,495	\$ 166,495
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,568	\$ 14,568	\$ 14,568	\$ 14,568
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,030	\$ 52,030	\$ 52,030	\$ 52,030
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,244	\$ 6,244	\$ 6,244	\$ 6,244
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 88,298	\$ 88,298	\$ -	\$ -	\$ 88,298	\$ 88,298
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,081	\$ 2,081	\$ 2,081	\$ 2,081
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 88,298		\$ 417,896		\$ 506,194

**NG & NY Transco - T018 - (Segment A)**

**G. Edic Substation - Removal**

Estimate Revision: 5

Total: \$ 41,740

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>G. Edic Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 14,200	\$ 14,200
3. SUBSTATION STRUCTURES	\$ -	\$ 6,750	\$ 6,750
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 10,500	\$ 10,500
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 5,790	\$ 5,790
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 41,740	\$ 41,740
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 41,740	\$ 41,740

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Edic Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1									
1.2									
1.3									
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 14,200	\$ 14,200	\$ 14,200	\$ 14,200
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 14,200		\$ 14,200
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	3	EA	\$ -	\$ -	\$ 2,250	\$ 6,750	\$ 2,250	\$ 6,750
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 6,750		\$ 6,750
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 10,500.00	\$ 10,500	\$ 10,500	\$ 10,500
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 10,500		\$ 10,500
<b>G. Edic Substation - Removal</b>					\$ -		\$ 35,950		\$ 35,950
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,728	\$ 1,728	\$ 1,728	\$ 1,728
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 360	\$ 360	\$ 360	\$ 360
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,876	\$ 2,876	\$ 2,876	\$ 2,876
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 252	\$ -	\$ 252	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 899	\$ -	\$ 899	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 108	\$ 108	\$ 108	\$ 108
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 36	\$ -	\$ 36	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 5,790		\$ 5,790

**NG & NY Transco - T018 - (Segment A)**

**H. New Scotland Substation - Install**

Estimate Revision: **5** Total: \$ **8,532,315**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>H. New Scotland Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 30,750	\$ 233,063	\$ 263,813
2. SUBSTATION FOUNDATIONS	\$ 498,996	\$ 534,400	\$ 1,033,396
3. SUBSTATION STRUCTURES	\$ 240,500	\$ 240,500	\$ 481,000
4. MAJOR EQUIPMENT	\$ 1,000,000	\$ 400,000	\$ 1,400,000
5. SMALL EQUIPMENT / MATERIALS	\$ 399,500	\$ 188,000	\$ 587,500
6. CONTROL HOUSE / PANELS	\$ 749,150	\$ 372,900	\$ 1,122,050
7. MISC ITEMS	\$ 897,304	\$ 1,093,110	\$ 1,990,414
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 305,296	\$ 1,348,847	\$ 1,654,143
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 4,121,496</b>	<b>\$ 4,410,819</b>	<b>\$ 8,532,315</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 4,121,496</b>	<b>\$ 4,410,819</b>	<b>\$ 8,532,315</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. New Scotland Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0.94	ACRES	\$ -	\$ -	\$ 203,000	\$ 190,313	\$ 203,000	\$ 190,313
1.2	Station stone within substation fence.	250	CY	\$ 27	\$ 6,750	\$ 75	\$ 18,750	\$ 102	\$ 25,500
1.3	Substation Fence	240	LF	\$ 100	\$ 24,000	\$ 100	\$ 24,000	\$ 200	\$ 48,000
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 30,750		\$ 233,063		\$ 263,813
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	5	EA	\$ 14,940	\$ 74,700	\$ 16,000	\$ 80,000	\$ 30,940	\$ 154,700
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	18	EA	\$ 4,482	\$ 80,676	\$ 4,800	\$ 86,400	\$ 9,282	\$ 167,076
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	32	EA	\$ 4,482	\$ 143,424	\$ 4,800	\$ 153,600	\$ 9,282	\$ 297,024
2.1j	Instrument Transformer Stand Foundations	15	EA	\$ 4,482	\$ 67,230	\$ 4,800	\$ 72,000	\$ 9,282	\$ 139,230
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 498,996		\$ 534,400		\$ 1,033,396
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	3	EA	\$ 14,800	\$ 44,400	\$ 14,800	\$ 44,400	\$ 29,600	\$ 88,800
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	32	EA	\$ 3,700	\$ 118,400	\$ 3,700	\$ 118,400	\$ 7,400	\$ 236,800
3.1g	Instrument Transformer Stand	15	EA	\$ 1,850	\$ 27,750	\$ 1,850	\$ 27,750	\$ 3,700	\$ 55,500
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 240,500		\$ 240,500		\$ 481,000
<b>4. MAJOR EQUIPMENT</b>									
4.1	<b>345kV</b>								
4.1a	Circuit Breakers	5	EA	\$ 200,000	\$ 1,000,000	\$ 80,000	\$ 400,000	\$ 280,000	\$ 1,400,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.2	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.3	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 1,000,000		\$ 400,000		\$ 1,400,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
5.1	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ 35,000	\$ 105,000	\$ 17,500	\$ 52,500	\$ 52,500	\$ 157,500
5.1c	VT'S	3	EA	\$ 35,000	\$ 105,000	\$ 12,000	\$ 36,000	\$ 47,000	\$ 141,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 8,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
5.2	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 30,000	\$ -	\$ 8,000	\$ -	\$ 38,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
5.3	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 28,000	\$ -	\$ 8,000	\$ -	\$ 36,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 399,500		\$ 188,000		\$ 587,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 243,750	\$ 243,750	\$ 42,500	\$ 42,500	\$ 286,250	\$ 286,250

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	7	EA	\$ 35,000	\$ 245,000	\$ 10,000	\$ 70,000	\$ 45,000	\$ 315,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 260,400	\$ 260,400	\$ 260,400	\$ 260,400	\$ 520,800	\$ 520,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 749,150		\$ 372,900		\$ 1,122,050
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	2,500.0	LF	\$ 185.00	\$ 462,500	\$ 170.00	\$ 425,000	\$ 355	\$ 887,500
7.2	Rigid Bus, Fittings & Insulators	700.0	LF	\$ 125.07	\$ 87,549	\$ 237.10	\$ 165,970	\$ 362	\$ 253,519
7.3	Strain Bus, Connectors & Insulators	200.0	LF	\$ 39.30	\$ 7,860	\$ 53.35	\$ 10,670	\$ 93	\$ 18,530
7.4	Grounding System	1,500.0	LF	\$ 6.93	\$ 10,395	\$ 32.58	\$ 48,870	\$ 40	\$ 59,265
7.5	Strain Bus Insulators - 345kV	12	EA	\$ 2,000	\$ 24,000	\$ 1,050	\$ 12,600	\$ 3,050	\$ 36,600
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12	Install new communication tower foundation	1	LS	\$ -	\$ -	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000
7.13	Relocate existing communication tower	1	LS	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 897,304		\$ 1,093,110		\$ 1,990,414
<b>H. New Scotland Substation - Install</b>					\$ 3,816,200		\$ 3,061,973		\$ 6,878,173
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 68,782	\$ 68,782	\$ 68,782	\$ 68,782
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 330,634	\$ 330,634	\$ 330,634	\$ 330,634
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 68,782	\$ 68,782	\$ 68,782	\$ 68,782
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 68,782	\$ 68,782	\$ 68,782	\$ 68,782
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 550,254	\$ 550,254	\$ 550,254	\$ 550,254
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 48,147	\$ 48,147	\$ 48,147	\$ 48,147
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 171,954	\$ 171,954	\$ 171,954	\$ 171,954
<b>Permitting and Additional Costs</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 20,635	\$ 20,635	\$ 20,635	\$ 20,635
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 305,296	\$ 305,296	\$ -	\$ -	\$ 305,296	\$ 305,296
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 6,878	\$ 6,878	\$ 6,878	\$ 6,878
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 305,296		\$ 1,348,847		\$ 1,654,143

**NG & NY Transco - T018 - (Segment A)**

**I. New Scotland Substation - Removal**

Estimate Revision: **5**

Total: \$ **184,697**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>I. New Scotland Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 30,000	\$ 30,000
2. SUBSTATION FOUNDATIONS	\$ -	\$ 57,200	\$ 57,200
3. SUBSTATION STRUCTURES	\$ -	\$ 27,000	\$ 27,000
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 7,000	\$ 7,000
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 37,875	\$ 37,875
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 25,622	\$ 25,622
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 184,697	\$ 184,697
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 184,697	\$ 184,697

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. New Scotland Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Substation Fence	200	LF	\$ -	\$ -	\$ 150	\$ 30,000	\$ 150	\$ 30,000
1.2									
1.3									
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 30,000		\$ 30,000
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	2	EA	\$ -	\$ -	\$ 14,200	\$ 28,400	\$ 14,200	\$ 28,400
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	12	EA	\$ -	\$ -	\$ 2,400	\$ 28,800	\$ 2,400	\$ 28,800
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 57,200		\$ 57,200
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	12	EA	\$ -	\$ -	\$ 2,250	\$ 27,000	\$ 2,250	\$ 27,000
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 27,000		\$ 27,000
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	1	EA	\$ -	\$ -	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 7,000		\$ 7,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	300	EA	\$ 126.25	\$ -	\$ -	\$ 37,875	\$ 126	\$ 37,875
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 37,875		\$ 37,875
<b>I. New Scotland Substation - Removal</b>					\$ -		\$ 159,075		\$ 159,075
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,591	\$ 1,591	\$ 1,591	\$ 1,591
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 7,647	\$ 7,647	\$ 7,647	\$ 7,647
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,591	\$ 1,591	\$ 1,591	\$ 1,591
8.4	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 1,591	\$ 1,591	\$ 1,591	\$ 1,591
<b>Engineering</b>									
8.5	Design Engineering	1.0	LS	\$ -	\$ -	\$ 12,726	\$ 12,726	\$ 12,726	\$ 12,726
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 1,114	\$ -	\$ 1,114	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 3,977	\$ -	\$ 3,977	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 477	\$ 477	\$ 477	\$ 477
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1.0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 159	\$ -	\$ 159	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 25,622		\$ 25,622

**NG & NY Transco - T018 - (Segment A)**

**J. Porter Substation - Install**

Estimate Revision: **5**

Total: \$ **87,069**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ 15,008	\$ 56,904	\$ 71,912
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,201	\$ 13,956	\$ 15,157
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 16,209	\$ 70,860	\$ 87,069
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 16,209	\$ 70,860	\$ 87,069

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Porter Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -	\$ -	\$ -	\$ -	\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 300,000	\$ -	\$ 80,000	\$ -	\$ 380,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 225,000	\$ -	\$ 60,000	\$ -	\$ 285,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 40,000	\$ -	\$ 17,500	\$ -	\$ 57,500	\$ -
5.1c	VT'S	0	EA	\$ 35,000	\$ -	\$ 12,000	\$ -	\$ 47,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 30,000	\$ -	\$ 15,000	\$ -	\$ 45,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.2c	VT'S	0	EA	\$ 30,000	\$ -	\$ 8,000	\$ -	\$ 38,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 28,000	\$ -	\$ 15,000	\$ -	\$ 43,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 33,000	\$ -	\$ 17,500	\$ -	\$ 50,500	\$ -
5.3c	VT'S	0	EA	\$ 28,000	\$ -	\$ 8,000	\$ -	\$ 36,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	0	EA	\$ 35,000	\$ -	\$ 10,000	\$ -	\$ 45,000	\$ -
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ 15,008.40	\$ 15,008	\$ 56,904.00	\$ 56,904	\$ 71,912	\$ 71,912
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.11	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>J. Porter Substation - Install</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,457	\$ 3,457	\$ 3,457	\$ 3,457
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 719	\$ 719	\$ 719	\$ 719
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,753	\$ 5,753	\$ 5,753	\$ 5,753
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 503	\$ 503	\$ 503	\$ 503
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,798	\$ 1,798	\$ 1,798	\$ 1,798
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 216	\$ 216	\$ 216	\$ 216
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,201	\$ 1,201	\$ -	\$ -	\$ 1,201	\$ 1,201
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 72	\$ 72	\$ 72	\$ 72
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,201		\$ 13,956		\$ 15,157

**NG & NY Transco - T018 - (Segment A)**

**K. Porter Substation - Removal**

Estimate Revision: 5

Total: \$ 557,825

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>K. Porter Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 126,600	\$ 126,600
3. SUBSTATION STRUCTURES	\$ -	\$ 206,100	\$ 206,100
4. MAJOR EQUIPMENT	\$ -	\$ 43,500	\$ 43,500
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 59,500	\$ 59,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 38,613	\$ 38,613
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 83,512	\$ 83,512
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 557,825	\$ 557,825
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 557,825	\$ 557,825

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Porter Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1</b>	<b>345kV</b>								
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	3	EA	\$ -	\$ -	\$ 7,200	\$ 21,600	\$ 7,200	\$ 21,600
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	5	EA	\$ -	\$ -	\$ 5,200	\$ 26,000	\$ 5,200	\$ 26,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	4	EA	\$ -	\$ -	\$ 2,400	\$ 9,600	\$ 2,400	\$ 9,600
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4 Transformer Foundations</b>									
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5 Control House Foundations / Pad</b>									
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6 Lightning Mast Foundations</b>									
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -	\$ -	\$ 126,600		\$ 126,600
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1 345kV</b>									
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	6	EA	\$ -	\$ -	\$ 9,750	\$ 58,500	\$ 9,750	\$ 58,500
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -	\$ -	\$ 206,100		\$ 206,100

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	3	EA	\$ -	\$ -	\$ 14,500	\$ 43,500	\$ 14,500	\$ 43,500
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>						\$ -	\$ 43,500		\$ 43,500
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	2	EA	\$ -	\$ -	\$ 5,500	\$ 11,000	\$ 5,500	\$ 11,000
5.2b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2c	VT'S	2	EA	\$ -	\$ -	\$ 1,500	\$ 3,000	\$ 1,500	\$ 3,000
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	6	EA	\$ -	\$ -	\$ 1,500	\$ 9,000	\$ 1,500	\$ 9,000
5.2f	Arresters	6	EA	\$ -	\$ -	\$ 2,500	\$ 15,000	\$ 2,500	\$ 15,000
5.2g	Wave Traps	2	EA	\$ -	\$ -	\$ 2,500	\$ 5,000	\$ 2,500	\$ 5,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>						\$ -	\$ 59,500		\$ 59,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>						\$ -	\$ -		\$ -
<b>7. MISC ITEMS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ -	\$ -	\$ 18,937.50	\$ 18,938	\$ 18,938	\$ 18,938
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ -	\$ -	\$ 19,675.00	\$ 19,675	\$ 19,675	\$ 19,675
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 38,613		\$ 38,613
<b>K. Porter Substation - Removal</b>					\$ -		\$ 474,313		\$ 474,313
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 11,858	\$ 11,858	\$ 11,858	\$ 11,858
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 22,800	\$ 22,800	\$ 22,800	\$ 22,800
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
8.4	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Engineering</b>									
8.5	Design Engineering	1.0	LS	\$ -	\$ -	\$ 37,945	\$ 37,945	\$ 37,945	\$ 37,945
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 3,320	\$ -	\$ 3,320	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 11,858	\$ -	\$ 11,858	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,423	\$ 1,423	\$ 1,423	\$ 1,423
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1.0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 474	\$ -	\$ 474	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 83,512		\$ 83,512

**NG & NY Transco - T018 - (Segment A)**

**L. Interconnection Edic Station**

Estimate Revision: **5** Total: \$ 2,122,073

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>L. Interconnection Edic Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 168,366	\$ 170,169	\$ 338,536
3. STRUCTURES	\$ 501,469	\$ 321,821	\$ 823,289
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 160,000	\$ 94,400	\$ 254,400
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 66,387	\$ 271,611	\$ 337,998
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 896,222</b>	<b>\$ 1,225,851</b>	<b>\$ 2,122,073</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 896,222</b>	<b>\$ 1,225,851</b>	<b>\$ 2,122,073</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Edic Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ -	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18									
1.19									
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8'X 27'	3	EA	\$ 41,332	\$ 123,995	\$ 41,774	\$ 125,322	\$ 83,106	\$ 249,317
2.2	Foundation – Drilled Pier – 8'X 29'	1	EA	\$ 44,372	\$ 44,372	\$ 44,847	\$ 44,847	\$ 89,219	\$ 89,219
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 168,366		\$ 170,169		\$ 338,536
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) – 105'	3	Structure	\$ 98,883	\$ 296,648	\$ 59,330	\$ 177,989	\$ 158,212	\$ 474,636
3.2	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.3	Install Grounding and Grounding Accessories	4	Pole	\$ 506	\$ 2,024	\$ 5,539	\$ 22,154	\$ 6,045	\$ 24,178
3.4					\$ -		\$ -		\$ -
3.5					\$ -		\$ -		\$ -
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 501,469		\$ 321,821		\$ 823,289
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -	\$ -	\$ -	\$ -	\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)		Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)		Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)		Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.11	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15					\$ -		\$ -		\$ -
5.16					\$ -		\$ -		\$ -
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 160,000		\$ 94,400		\$ 254,400
<b>L. Interconnection Edic Station</b>					\$ 829,835		\$ 954,240		\$ 1,784,075
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 85,760	\$ 85,760	\$ 85,760	\$ 85,760

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 89,204	\$ 89,204	\$ 89,204	\$ 89,204
6.6	LiDAR	-	LS	\$ -	\$ -	\$ 5,352	\$ -	\$ 5,352	\$ -
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,489	\$ 12,489	\$ 12,489	\$ 12,489
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,352	\$ 5,352	\$ 5,352	\$ 5,352
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 66,387	\$ 66,387	\$ -	\$ -	\$ 66,387	\$ 66,387
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 1,784	\$ 1,784	\$ 1,784	\$ 1,784
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 66,387		\$ 271,611		\$ 337,998

**NG & NY Transco - T018 - (Segment A)**

**M. Interconnection New Scotland Station**

Estimate Revision: **5** Total: \$ **3,101,204**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>M. Interconnection New Scotland Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 365,657	\$ 473,093	\$ 838,749
3. STRUCTURES	\$ 655,465	\$ 445,628	\$ 1,101,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,555	\$ 26,100	\$ 29,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 161,130	\$ 95,795	\$ 256,925
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 94,864	\$ 412,068	\$ 506,933
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,820,533</b>	<b>\$ 3,101,204</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,820,533</b>	<b>\$ 3,101,204</b>

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection New Scotland Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8'X 50'	3	EA	\$ 76,500	\$ 229,501	\$ 77,320	\$ 231,959	\$ 153,820	\$ 461,459
2.2	Foundation – Drilled Pier – 8'X 89'	1	EA	\$ 136,156	\$ 136,156	\$ 137,614	\$ 137,614	\$ 273,770	\$ 273,770
2.3	Rock Excavation Adder	51.8	CY	\$ -	\$ -	\$ 2,000	\$ 103,520	\$ 2,000	\$ 103,520
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 365,657		\$ 473,093		\$ 838,749
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	3	Structure	\$ 178,026	\$ 534,077	\$ 106,815	\$ 320,446	\$ 284,841	\$ 854,522
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	Install Grounding and Grounding Accessories	10	Structure	\$ 506	\$ 5,060	\$ 5,539	\$ 55,385	\$ 6,045	\$ 60,445
3.4					\$ -		\$ -		
3.5					\$ -		\$ -		
3.6					\$ -		\$ -		
3.7					\$ -		\$ -		
3.8					\$ -		\$ -		
3.9					\$ -		\$ -		
3.10					\$ -		\$ -		
3.11					\$ -		\$ -		
3.12					\$ -		\$ -		
3.13					\$ -		\$ -		
3.14					\$ -		\$ -		
3.15					\$ -		\$ -		
<b>TOTAL - STRUCTURES</b>					\$ 655,465		\$ 445,628		\$ 1,101,092
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal"	1,500	LF	\$ 1.90	\$ 2,850	\$ 5.00	\$ 7,500	\$ 6.90	\$ 10,350
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	1,500	LF	\$ 0.47	\$ 705	\$ 5.00	\$ 7,500	\$ 5.47	\$ 8,205
4.5	Remove Existing 345KV Cable From Existing Structures	0.3	Mile	\$ -	\$ -	\$ 30,000	\$ 7,500	\$ 30,000.00	\$ 7,500
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	0.3	Mile	\$ -	\$ -	\$ 12,000	\$ 3,600	\$ 12,000.00	\$ 3,600
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,555		\$ 26,100		\$ 29,655
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345KV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115KV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345KV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115KV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	9	EA	\$ 50	\$ 450	\$ 35	\$ 315	\$ 85	\$ 765
5.11	Vibration Dampers - Conductor	48	EA	\$ 35	\$ 1,680	\$ 35	\$ 1,680	\$ 70	\$ 3,360
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15					\$ -		\$ -		\$ -
5.16	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19					\$ -		\$ -		\$ -
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 161,130		\$ 95,795		\$ 256,925
<b>M. Interconnection New Scotland Station</b>					\$ 1,185,806		\$ 1,408,465		\$ 2,594,271
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 124,707	\$ 124,707	\$ 124,707	\$ 124,707
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 129,714	\$ 129,714	\$ 129,714	\$ 129,714
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 18,160	\$ 18,160	\$ 18,160	\$ 18,160
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 94,864	\$ 94,864	\$ -	\$ -	\$ 94,864	\$ 94,864
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,594	\$ 2,594	\$ 2,594	\$ 2,594
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 94,864		\$ 412,068		\$ 506,933

**NG & NY Transco - T018 - (Segment A)**

**N. Interconnection Rotterdam Station**

Estimate Revision: **5** Total: \$ **4,781,500**

NG & NY Transco - T018 - (Segment A)			
	Supply	Installation	Total
<b>N. Interconnection Rotterdam Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,233,050	\$ 1,233,050
2. FOUNDATIONS	\$ 192,145	\$ 325,963	\$ 518,108
3. STRUCTURES	\$ 546,722	\$ 995,362	\$ 1,542,084
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 65,923	\$ 437,250	\$ 503,173
5. INSULATORS, FITTINGS, HARDWARE	\$ 165,730	\$ 118,480	\$ 284,210
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 77,642	\$ 623,234	\$ 700,876
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,733,339</b>	<b>\$ 4,781,500</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,733,339</b>	<b>\$ 4,781,500</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Rotterdam Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	7.0	Acre	\$ -	\$ -	\$ 15,000	\$ 105,000	\$ 15,000	\$ 105,000
1.2	Clearing the ROW - Light (mowing)	5.0	Acre	\$ -	\$ -	\$ 5,000	\$ 25,000	\$ 5,000	\$ 25,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	4,800.0	LF	\$ -	\$ -	\$ 4	\$ 19,200	\$ 4	\$ 19,200
1.5	Matting - Access and ROW	4,800.0	LF	\$ -	\$ -	\$ 70	\$ 336,000	\$ 70	\$ 336,000
1.6	Matting - To Work Area	2,400.0	LF	\$ -	\$ -	\$ 70	\$ 168,000	\$ 70	\$ 168,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	1.0	Mile	\$ -	\$ -	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
1.9	Work Pads	160,000.0	SF	\$ -	\$ -	\$ 4	\$ 563,200	\$ 4	\$ 563,200
1.10	Restoration for Work Pad areas	32,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 4,800	\$ 0	\$ 4,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 1,233,050		\$ 1,233,050
<b>2. FOUNDATIONS</b>									
2.1	10' ED Rock BF	6	EA	\$ 358	\$ 2,145	\$ 3,575	\$ 21,450	\$ 3,933	\$ 23,595
2.2	15' ED Rock BF	18	EA	\$ 536	\$ 9,653	\$ 5,363	\$ 96,525	\$ 5,899	\$ 106,178
2.3	20' ED Rock BF	4	EA	\$ 715	\$ 2,860	\$ 7,150	\$ 28,600	\$ 7,865	\$ 31,460
2.4	Foundation - Drilled Pier - 8'X 29'	4	EA	\$ 44,372	\$ 177,487	\$ 44,847	\$ 179,388	\$ 89,219	\$ 356,875
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 192,145		\$ 325,963		\$ 518,108
<b>3. STRUCTURES</b>									
3.1	15kv 3-CKT TANGENT DIST. - WOOD POLE	3	Pole	\$ 3,500	\$ 10,500	\$ 3,600	\$ 10,800	\$ 7,100	\$ 21,300
3.2	15kv 3-CKT MA DIST. - WOOD POLE	1	Pole	\$ 3,500	\$ 3,500	\$ 3,600	\$ 3,600	\$ 7,100	\$ 7,100
3.3	15kv 3-CKT DE - WOOD POLE	2	Pole	\$ 3,500	\$ 7,000	\$ 3,600	\$ 7,200	\$ 7,100	\$ 14,200
3.4	115kv 1-CKT TANGENT - WOOD POLE	5	Pole	\$ 4,500	\$ 22,500	\$ 4,400	\$ 22,000	\$ 8,900	\$ 44,500
3.5	115kv 1-CKT MA - WOOD POLE	2	Pole	\$ 4,500	\$ 9,000	\$ 4,400	\$ 8,800	\$ 8,900	\$ 17,800
3.6	115kv 1-CKT DE - WOOD POLE	11	Pole	\$ 5,500	\$ 60,500	\$ 5,000	\$ 55,000	\$ 10,500	\$ 115,500
3.7	115kv 2-CKT TANGENT - WOOD POLE	4	Pole	\$ 5,500	\$ 22,000	\$ 5,000	\$ 20,000	\$ 10,500	\$ 42,000
3.8	115kv 2-CKT DE - STEEL POLE	4	Pole	\$ 98,883	\$ 395,530	\$ 98,883	\$ 395,530	\$ 197,765	\$ 791,060
3.9	Remove Existing Structure	24	EA		\$ -	\$ 12,300	\$ 295,200	\$ 12,300	\$ 295,200
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12	Install Grounding and Grounding Accessories	32	Structure	\$ 506	\$ 16,192	\$ 5,539	\$ 177,232	\$ 6,045	\$ 193,424
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 546,722		\$ 995,362		\$ 1,542,084
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	23,400	LF	\$ 1.90	\$ 44,460	\$ 5.00	\$ 117,000	\$ 6.90	\$ 161,460
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	7,800	LF	\$ 0.47	\$ 3,666	\$ 5.00	\$ 39,000	\$ 5.47	\$ 42,666
4.5	Remove Existing Cable	6.6	Mile	\$ -	\$ -	\$ 30,000	\$ 197,700	\$ 30,000.00	\$ 197,700
4.6	Remove Existing EHV	2.2	Mile	\$ -	\$ -	\$ 12,000	\$ 26,400	\$ 12,000.00	\$ 26,400
4.7	15kv - (1) 477kcmil 26/7 ACSR "Hawk"	9,630	LF	\$ 1.62	\$ 15,601	\$ 5.00	\$ 48,150	\$ 6.62	\$ 63,751
4.8	15kv - (1) 336kcmil 26/7 ACSR "Linnet"	1,800	LF	\$ 1.22	\$ 2,196	\$ 5.00	\$ 9,000	\$ 6.22	\$ 11,196
4.9		-			\$ -		\$ -		\$ -
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 65,923		\$ 437,250		\$ 503,173
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	115kv Tangent (1-Group of 9-Bells Each Assembly)	33	Assembly	\$ 1,000	\$ 33,000	\$ 560	\$ 18,480	\$ 1,560	\$ 51,480
5.2	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	66	Assembly	\$ 1,000	\$ 66,000	\$ 560	\$ 36,960	\$ 1,560	\$ 102,960
5.3	15kv Tangent	12	Assembly	\$ 100	\$ 1,200	\$ 75	\$ 900	\$ 175	\$ 2,100
5.4	15kv Dead-end & Angle Insulators	18	Assembly	\$ 100	\$ 1,800	\$ 75	\$ 1,350	\$ 175	\$ 3,150
5.5	Neutral, Distribution, Tangent	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.6	Neutral, Distribution, DE/Side	2	Assembly	\$ 100	\$ 200	\$ 75	\$ 150	\$ 175	\$ 350
5.7	Jumper, DE/Angle, 3PH	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.8	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OSHW Assembly - Tangent	11	Assembly	\$ 250	\$ 2,750	\$ 150	\$ 1,650	\$ 400	\$ 4,400
5.10	OHSW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.11	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.12	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.13	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.14	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.16	Guys, Anchors, and Accessories	14.0	EA	\$ 720	\$ 10,080	\$ 885	\$ 12,390	\$ 1,605	\$ 22,470
5.17	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	8	EA	\$ 5,000	\$ 40,000	\$ 5,000	\$ 40,000	\$ 10,000	\$ 80,000
5.20					\$ -		\$ -		\$ -
5.21					\$ -		\$ -		\$ -
5.22					\$ -		\$ -		\$ -
5.23					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 165,730		\$ 118,480		\$ 284,210
<b>N. Interconnection Rotterdam Station</b>					\$ 970,519		\$ 3,110,105		\$ 4,080,624
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
Contractor Mobilization / Demobilization									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 40,806	\$ 40,806	\$ 40,806	\$ 40,806
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 196,156	\$ 196,156	\$ 196,156	\$ 196,156
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 40,806	\$ 40,806	\$ 40,806	\$ 40,806
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 40,806	\$ 40,806	\$ 40,806	\$ 40,806
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 204,031	\$ 204,031	\$ 204,031	\$ 204,031
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 12,242	\$ 12,242	\$ 12,242	\$ 12,242
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 28,564	\$ 28,564	\$ 28,564	\$ 28,564
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 12,242	\$ 12,242	\$ 12,242	\$ 12,242
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 77,642	\$ 77,642	\$ -	\$ -	\$ 77,642	\$ 77,642
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 4,081	\$ 4,081	\$ 4,081	\$ 4,081
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 77,642		\$ 623,234		\$ 700,876

**NG & NY Transco - T018 - (Segment A)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 4.121% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.

<b>NextEra Energy (T021)</b>			
<b>Description</b>		<b>Total Amount (In thousand \$)</b>	
<b>Direct Cost</b>	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$55,279
	1.2	Foundations	\$18,318
	1.3	Structures	\$74,701
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$38,661
	1.5	Insulators, Fitting and Hardwares	\$18,280
	Subtotal (1)		<b>\$205,239</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$850
	2.2	Edic Substation	\$2,153
	2.3	Princetown Substation	\$40,296
	2.4	New Scotland Substation	\$6,883
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$4,378	
Subtotal (2)		<b>\$55,107</b>	
Total (1+2)		\$260,346	
Contractors Mark-up (15% of Total 1+2)		\$39,052	
Total Direct Cost (A)		<b>\$299,398</b>	
<b>Indirect Cost</b>	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,603
	3.2	Project Management, Material Handling & Amenities	\$18,440
	3.3	Engineering	\$17,327
	3.4	Testing & Commissioning	\$1,435
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$15,672
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,865
Total Indirect Cost (3)		<b>\$72,262</b>	
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$371,660</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	NUF proposed as element of the Project	\$0
	4.2	NUF identified during Evaluation	\$0
<b>Subtotal NUF Cost (C)</b>		<b>\$0</b>	
<b>Total Project Cost (B+C) 2017 \$</b>		<b>\$371,660</b>	
<b>Total Project Cost 2018 \$</b>		<b>\$382,810</b>	

**NextEra - T021 Enterprise Line - (Segment A)**

Estimate Revision: 5

<i>NextEra - T021 Enterprise Line - (Segment A) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Edic to Princetown	\$ 142,045,942
Direct Labor, Material & Equipment Costs	B. Transmission Line Princetown to Rotterdam	\$ 22,954,338
Direct Labor, Material & Equipment Costs	C. Transmission Line Princetown to New Scotland	\$ 40,238,473
Direct Labor, Material & Equipment Costs	D. Princetown Substation - Install	\$ 40,296,444
Direct Labor, Material & Equipment Costs	F. Edic Substation - Install	\$ 2,117,185
Direct Labor, Material & Equipment Costs	G. Edic Substation - Removal	\$ 35,950
Direct Labor, Material & Equipment Costs	H. New Scotland Substation - Install	\$ 6,740,673
Direct Labor, Material & Equipment Costs	I. New Scotland Substation - Removal	\$ 142,200
Direct Labor, Material & Equipment Costs	J. Porter Substation - Install	\$ 71,912
Direct Labor, Material & Equipment Costs	K. Porter Substation - Removal	\$ 474,313
Direct Labor, Material & Equipment Costs	L. Interconnection Edic Station	\$ 1,784,075
Direct Labor, Material & Equipment Costs	M. Interconnection New Scotland Station	\$ 2,594,271
Direct Labor, Material & Equipment Costs	N. Rotterdam Substation - Install	\$ 850,000
Direct Labor, Material & Equipment Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Direct Labor, Material & Equipment Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ -
<b>SUBTOTAL:</b>		<b>\$ 260,345,776</b>
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		<b>\$ 39,051,866</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>		<b>\$ -</b>
<b>TOTAL DIRECT:</b>		<b>\$ 299,397,642</b>

<i>NextEra - T021 Enterprise Line - (Segment A) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Edic to Princetown	\$ 37,373,534
Indirect Costs	B. Transmission Line Princetown to Rotterdam	\$ 4,659,697
Indirect Costs	C. Transmission Line Princetown to New Scotland	\$ 8,472,452
Indirect Costs	D. Princetown Substation - Install	\$ 10,527,866
Indirect Costs	F. Edic Substation - Install	\$ 521,904
Indirect Costs	G. Edic Substation - Removal	\$ 5,890
Indirect Costs	H. New Scotland Substation - Install	\$ 1,643,663
Indirect Costs	I. New Scotland Substation - Removal	\$ 26,852
Indirect Costs	J. Porter Substation - Install	\$ 29,355
Indirect Costs	K. Porter Substation - Removal	\$ 78,181
Indirect Costs	L. Interconnection Edic Station	\$ 342,922
Indirect Costs	M. Interconnection New Scotland Station	\$ 514,093
Indirect Costs	N. Interconnection Rotterdam Station	\$ 201,306
Indirect Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Indirect Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ -
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lisc. & Permit., and Envir. Mitagation)	\$ 7,864,674
<b>TOTAL INDIRECT:</b>		<b>\$ 72,262,388</b>

**TOTAL ESTIMATED COST: \$ 371,660,030**

**NextEra - T021 Enterprise Line - (Segment A)**

**A. Transmission Line Edic to Princetown**

Estimate Revision: **5** Total: \$ 179,419,477

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>A. Transmission Line Edic to Princetown</b>			
1. CLEARING & ACCESS	\$ 41,500	\$ 38,580,626	\$ 38,622,126
2. FOUNDATIONS	\$ 1,198,049	\$ 9,147,920	\$ 10,345,968
3. STRUCTURES	\$ 8,531,149	\$ 41,220,539	\$ 49,751,688
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 7,848,486	\$ 22,863,905	\$ 30,712,391
5. INSULATORS, FITTINGS, HARDWARE	\$ 8,560,788	\$ 4,052,981	\$ 12,613,769
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,094,398	\$ 35,279,137	\$ 37,373,534
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 28,274,369</b>	<b>\$ 151,145,108</b>	<b>\$ 179,419,477</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 28,274,369</b>	<b>\$ 151,145,108</b>	<b>\$ 179,419,477</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Edic to Princetown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	127.0	Acre		\$ -	\$ 5,000	\$ 635,000	\$ 5,000	\$ 635,000
1.3	Access Road	70,540.8	LF	\$ -	\$ -	\$ 45	\$ 3,174,336	\$ 45	\$ 3,174,336
1.4	Silt Fence	352,704.0	LF	\$ -	\$ -	\$ 4	\$ 1,410,816	\$ 4	\$ 1,410,816
1.5	Matting - Access and ROW	282,163.2	LF	\$ -	\$ -	\$ 70	\$ 19,751,424	\$ 70	\$ 19,751,424
1.6	Matting - To Work Area	25,200.0	LF	\$ -	\$ -	\$ 70	\$ 1,764,000	\$ 70	\$ 1,764,000
1.7	Snow Removal	66.8	Mile	\$ -	\$ -	\$ 16,000	\$ 1,068,800	\$ 16,000	\$ 1,068,800
1.8	ROW Restoration	66.8	Mile	\$ -	\$ -	\$ 10,000	\$ 668,000	\$ 10,000	\$ 668,000
1.9	Work Pads	2,625,000.0	SF	\$ -	\$ -	\$ 4	\$ 9,240,000	\$ 4	\$ 9,240,000
1.10	Restoration for Work Pad areas	525,000.0	SF	\$ -	\$ -	\$ 0.15	\$ 78,750	\$ 0	\$ 78,750
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	50	EA	\$ -	\$ -	\$ 4,580	\$ 229,000	\$ 4,580	\$ 229,000
1.14	Maintenance and Protection of Traffic on Public Roads	100	EA	\$ -	\$ -	\$ 4,130	\$ 413,000	\$ 4,130	\$ 413,000
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	17	EA	\$ 2,000	\$ 34,000	\$ 2,500	\$ 42,500	\$ 4,500	\$ 76,500
1.17	Concrete Washout Station	50	EA	\$ -	\$ -	\$ 1,850	\$ 92,500	\$ 1,850	\$ 92,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 41,500		\$ 38,580,626		\$ 38,622,126
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed - 345KV S/C CONC DELTA TANGENT	472	EA	\$ 1,739	\$ 820,985	\$ 11,828	\$ 5,582,698	\$ 13,567	\$ 6,403,683
2.2	Direct Embed - 345KV S/C CONC GUYED DEADEND	21	EA	\$ 1,943	\$ 40,800	\$ 13,212	\$ 277,443	\$ 15,154	\$ 318,243
2.3	Direct Embed - 345KV S/C CONC RUNNING ANGLE	22	EA	\$ 2,072	\$ 45,587	\$ 14,090	\$ 309,990	\$ 16,163	\$ 355,577
2.4	Drilled Pier - 345KV S/C STEEL DELTA TANGENT	5	EA	\$ 24,478	\$ 122,392	\$ 24,741	\$ 123,703	\$ 49,219	\$ 246,095
2.5	Drilled Pier - 345KV RUNNING ANGLE, STEEL	2	EA	\$ 32,128	\$ 64,257	\$ 32,473	\$ 64,945	\$ 64,601	\$ 129,202
2.6	Drilled Pier - 345KV SELF SUPPORT DEADEND, STEEL	3	EA	\$ 34,676	\$ 104,027	\$ 35,047	\$ 105,141	\$ 69,723	\$ 209,169
2.7	Rock Excavation Adder	1,342.0	CY	\$ -	\$ -	\$ 2,000	\$ 2,684,000	\$ 2,000	\$ 2,684,000
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,198,049		\$ 9,147,920		\$ 10,345,968
<b>3. STRUCTURES</b>									
3.1	345KV S/C CONCRETE DELTA TANGENT	472	Structure	\$ 14,930	\$ 7,046,960	\$ 47,964	\$ 22,639,079	\$ 62,894	\$ 29,686,039
3.2	345KV S/C CONCRETE GUYED DEADEND	21	Structure	\$ 17,582	\$ 369,222	\$ 60,144	\$ 1,263,021	\$ 77,726	\$ 1,632,243

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
3.3	345KV S/C CONCRETE GUYED RUNNING ANGLE	22	Structure	\$ 17,880	\$ 393,360	\$ 60,780	\$ 1,337,153	\$ 78,660	\$ 1,730,513
3.4	345KV S/C STEEL DELTA TANGENT	5	Structure	\$ 15,860	\$ 79,300	\$ 9,516	\$ 47,580	\$ 25,376	\$ 126,880
3.5	345KV RUNNING ANGLE, STEEL	2	Structure	\$ 62,900	\$ 125,800	\$ 37,740	\$ 75,480	\$ 100,640	\$ 201,280
3.6	345KV SELF SUPPORT DEADEND, STEEL	3	Structure	\$ 83,619	\$ 250,856	\$ 50,171	\$ 150,514	\$ 133,790	\$ 401,370
3.7	Remove Existing Foundation	50	EA	\$ -	\$ -	\$ 7,500	\$ 375,000	\$ 7,500	\$ 375,000
3.8	Remove Existing Structure and Accessories	994	EA	\$ -	\$ -	\$ 12,500	\$ 12,425,000	\$ 12,500	\$ 12,425,000
3.9	Install Grounding and Grounding Accessories	525	Pole	\$ 506	\$ 265,650	\$ 5,539	\$ 2,907,713	\$ 6,045	\$ 3,173,363
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 8,531,149		\$ 41,220,539		\$ 49,751,688
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 1033kcmil 54/7 ACSS "Curlew"	2,501,453	LF	\$ 2.82	\$ 7,054,097	\$ 5.00	\$ 12,507,265	\$ 7.82	\$ 19,561,362
4.2	(1) OPGW 36 Fiber AC-33/38/571	347,054	LF	\$ 1.35	\$ 468,523	\$ 5.00	\$ 1,735,270	\$ 6.35	\$ 2,203,793
4.3	(1) 7/16" EHS7 Steel	347,054	LF	\$ 0.47	\$ 163,115	\$ 5.00	\$ 1,735,270	\$ 5.47	\$ 1,898,385
4.4	Remove Existing Conductor and Accessories	121.0	Mile	\$ -	\$ -	\$ 30,000	\$ 3,630,000	\$ 30,000.00	\$ 3,630,000
4.5	Remove Existing OPGW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.6	Remove Existing OHSW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.7	Rider Poles (187 Locations)	93	Set	\$ 1,750	\$ 162,750	\$ 3,500	\$ 325,500	\$ 5,250.00	\$ 488,250
4.8	Rider Poles - Relocated	94	Set	\$ -	\$ -	\$ 3,500	\$ 329,000	\$ 3,500.00	\$ 329,000
4.9									
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 7,848,486		\$ 22,863,905		\$ 30,712,391
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	3,006	Assembly	\$ 1,800	\$ 5,410,800	\$ 720	\$ 2,164,320	\$ 2,520	\$ 7,575,120
5.2	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	360	Assembly	\$ 1,800	\$ 648,000	\$ 720	\$ 259,200	\$ 2,520	\$ 907,200
5.3			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.4	OPGW Assembly - Tangent	501	Assembly	\$ 200	\$ 100,200	\$ 150	\$ 75,150	\$ 350	\$ 175,350
5.5	OPGW Assembly - Angle / DE	48	Assembly	\$ 250	\$ 12,000	\$ 150	\$ 7,200	\$ 400	\$ 19,200
5.6	OHSW Assembly - Tangent	501	Assembly	\$ 200	\$ 100,200	\$ 150	\$ 75,150	\$ 350	\$ 175,350
5.7	OHSW Assembly - Angle / DE	48	Assembly	\$ 250	\$ 12,000	\$ 150	\$ 7,200	\$ 400	\$ 19,200
5.8	OPGW Splice Boxes	42	Assembly	\$ 1,746	\$ 73,338	\$ 2,274	\$ 95,508	\$ 4,020	\$ 168,846
5.9	OPGW Splice & Test	42	EA	\$ 2,520	\$ 105,840	\$ 2,520	\$ 105,840	\$ 5,040	\$ 211,680
5.10	Spacer - Conductor	11,077	EA	\$ 50	\$ 553,850	\$ 35	\$ 387,695	\$ 85	\$ 941,545
5.11	Vibration Dampers - Conductor	2,658	EA	\$ 35	\$ 93,030	\$ 35	\$ 93,030	\$ 70	\$ 186,060
5.12	Shield wire / OPGW Dampers, Misc. Fittings	1,090	EA	\$ 27	\$ 29,430	\$ 35	\$ 38,150	\$ 62	\$ 67,580
5.13									
5.14	Replace - Mono Pole Vertical Tangent - V-String	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.15	Replace - Dead-end & Angle Insulators	195	Assembly	\$ 1,800	\$ 351,000	\$ 720	\$ 140,400	\$ 2,520	\$ 491,400
5.16									
5.17	Guys, Anchors, and Accessories	188	EA	\$ 828	\$ 155,664	\$ 1,018	\$ 191,337	\$ 1,846	\$ 347,001
5.18	Misc. materials (Signs and Markers)	66.8	Mile	\$ 770	\$ 51,436	\$ 1,006	\$ 67,201	\$ 1,776	\$ 118,637
5.19		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 8,560,788		\$ 4,052,981		\$ 12,613,769
<b>A. Transmission Line Edic to Princetown</b>					\$ 26,179,971		\$ 115,865,971		\$ 142,045,942

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,420,459	\$ 1,420,459	\$ 1,420,459	\$ 1,420,459
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 7,220,195	\$ 7,220,195	\$ 7,220,195	\$ 7,220,195
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,420,459	\$ 1,420,459	\$ 1,420,459	\$ 1,420,459
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,420,459	\$ 1,420,459	\$ 1,420,459	\$ 1,420,459
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 7,102,297	\$ 7,102,297	\$ 7,102,297	\$ 7,102,297
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 426,138	\$ 426,138	\$ 426,138	\$ 426,138
6.7	Geotech	55.0	Location	\$ -	\$ -	\$ 3,500	\$ 192,500	\$ 3,500	\$ 192,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 994,322	\$ 994,322	\$ 994,322	\$ 994,322
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	EA	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 426,138	\$ 426,138	\$ 426,138	\$ 426,138
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 5,555,000	\$ 5,555,000	\$ 5,555,000	\$ 5,555,000
6.15	Legal Fees		LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Compensation for use of 1 Ckt - NYPA Structures (92 Structures)	1	LS	\$ -	\$ -	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123
6.18	Sales Tax on Materials	1	LS	\$ 2,094,398	\$ 2,094,398	\$ -	\$ -	\$ 2,094,398	\$ 2,094,398
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 142,046	\$ 142,046	\$ 142,046	\$ 142,046
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,094,398		\$ 35,279,137		\$ 37,373,534

**NextEra - T021 Enterprise Line - (Segment A)**

**B. Transmission Line Princetown to Rotterdam**

Estimate Revision: **5** Total: \$ **27,614,035**

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>B. Transmission Line Princetown to Rotterdam</b>			
1. CLEARING & ACCESS	\$ 6,000	\$ 4,789,200	\$ 4,795,200
2. FOUNDATIONS	\$ 891,972	\$ 4,104,882	\$ 4,996,854
3. STRUCTURES	\$ 2,675,074	\$ 7,029,527	\$ 9,704,602
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 128,126	\$ 852,170	\$ 980,296
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,682,833	\$ 794,553	\$ 2,477,386
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 430,720	\$ 4,228,977	\$ 4,659,697
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 5,814,726	\$ 21,799,309	\$ 27,614,035
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 5,814,726	\$ 21,799,309	\$ 27,614,035

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Princetown to Rotterdam</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	20.0	Acre	\$ -	\$ -	\$ 5,000	\$ 100,000	\$ 5,000	\$ 100,000
1.3	Access Road	5,280.0	LF	\$ -	\$ -	\$ 45	\$ 237,600	\$ 45	\$ 237,600
1.4	Silt Fence	26,400.0	LF	\$ -	\$ -	\$ 4	\$ 105,600	\$ 4	\$ 105,600
1.5	Matting - Access and ROW	21,120.0	LF	\$ -	\$ -	\$ 70	\$ 1,478,400	\$ 70	\$ 1,478,400
1.6	Matting - To Work Area	8,550.0	LF	\$ -	\$ -	\$ 70	\$ 598,500	\$ 70	\$ 598,500
1.7	Snow Removal	5.0	Mile	\$ -	\$ -	\$ 16,000	\$ 80,000	\$ 16,000	\$ 80,000
1.8	ROW Restoration	5.0	Mile	\$ -	\$ -	\$ 10,000	\$ 50,000	\$ 10,000	\$ 50,000
1.9	Work Pads	570,000.0	SF	\$ -	\$ -	\$ 4	\$ 2,006,400	\$ 4	\$ 2,006,400
1.10	Restoration for Work Pad areas	114,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 17,100	\$ 0	\$ 17,100
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	10	EA	\$ -	\$ -	\$ 4,580	\$ 45,800	\$ 4,580	\$ 45,800
1.14	Maintenance and Protection of Traffic on Public Roads	10	EA	\$ -	\$ -	\$ 4,130	\$ 41,300	\$ 4,130	\$ 41,300
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 6,000		\$ 4,789,200		\$ 4,795,200
<b>2. FOUNDATIONS</b>									
2.1	<i>Direct Embed</i> - 230KV S/C STEEL GUYED DEADEND	4	EA	\$ 1,200	\$ 4,802	\$ 8,163	\$ 32,650	\$ 9,363	\$ 37,452
2.2	<i>Direct Embed</i> - 230KV S/C STEEL GUYED RUNNING ANGLE	24	EA	\$ 1,416	\$ 33,990	\$ 9,631	\$ 231,132	\$ 11,047	\$ 265,122
2.3	<i>Direct Embed</i> - 230 KV GUYED ANGLE, STEEL	6	EA	\$ 1,471	\$ 8,828	\$ 10,005	\$ 60,027	\$ 11,476	\$ 68,855
2.4	<i>Direct Embed</i> - 345KV S/C CONC DELTA TANGENT	70	EA	\$ 2,229	\$ 156,021	\$ 15,156	\$ 1,060,945	\$ 17,385	\$ 1,216,966
2.5	<i>Direct Embed</i> - 345KV GUYED DEADEND, CONCRETE	2	EA	\$ 1,920	\$ 3,839	\$ 13,053	\$ 26,105	\$ 14,972	\$ 29,944
2.6	<i>Drilled Pier</i> - 345KV S/C STEEL SELF SUPPORTING DEADEND	1	EA	\$ 32,128	\$ 32,128	\$ 32,473	\$ 32,473	\$ 64,601	\$ 64,601
2.7	<i>Drilled Pier</i> - 345KV THREE POLE TAP, STEEL	6	EA	\$ 96,377	\$ 578,263	\$ 97,409	\$ 584,456	\$ 193,787	\$ 1,162,719
2.8	<i>Drilled Pier</i> - 345KV STEEL D/C DEADEND , STEEL	1	EA	\$ 74,101	\$ 74,101	\$ 74,894	\$ 74,894	\$ 148,995	\$ 148,995
2.9	Rock Excavation Adder	1,001.1	CY	\$ -	\$ -	\$ 2,000	\$ 2,002,200	\$ 2,000	\$ 2,002,200
<b>TOTAL - FOUNDATIONS:</b>					\$ 891,972		\$ 4,104,882		\$ 4,996,854
<b>3. STRUCTURES</b>									
3.1	345KV RUNNING ANGLE, STEEL	24	Structure	\$ 17,074	\$ 409,775	\$ 10,244	\$ 245,865	\$ 27,318	\$ 655,640

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2	345KV SELF SUPPORT DEADEND, STEEL	6	Structure	\$ 10,268	\$ 61,605	\$ 6,161	\$ 36,963	\$ 16,428	\$ 98,568
3.3	230 KV GUYED DEADEND, STEEL	4	Structure	\$ 12,025	\$ 48,100	\$ 7,215	\$ 28,860	\$ 19,240	\$ 76,960
3.4	345KV S/C DEADEND, STEEL	1	Structure	\$ 74,000	\$ 74,000	\$ 44,400	\$ 44,400	\$ 118,400	\$ 118,400
3.5	345KV THREE POLE TAP, STEEL	6	Structure	\$ 166,500	\$ 999,000	\$ 99,900	\$ 599,400	\$ 266,400	\$ 1,598,400
3.6	345KV STEEL D/C DEADEND , STEEL	1	Structure	\$ 101,750	\$ 101,750	\$ 61,050	\$ 61,050	\$ 162,800	\$ 162,800
3.7	345KV S/C CONCRETE DELTA TANGENT	70	Structure	\$ 12,990	\$ 909,300	\$ 53,923	\$ 3,774,600	\$ 66,913	\$ 4,683,900
3.8	345KV S/C CONCRETE GUYED RUNNING ANGLE	1	Structure	\$ 13,860	\$ 13,860	\$ 81,000	\$ 81,000	\$ 94,860	\$ 94,860
3.9	Remove Existing Foundation	22	EA	\$ -	\$ -	\$ 7,500	\$ 163,500	\$ 7,500	\$ 163,500
3.10	Remove Existing Structure and Accessories	109	EA	\$ -	\$ -	\$ 12,500	\$ 1,362,500	\$ 12,500	\$ 1,362,500
3.11	Install Grounding and Grounding Accessories	114	Pole	\$ 506	\$ 57,684	\$ 5,539	\$ 631,389	\$ 6,045	\$ 689,073
3.12									
3.13									
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 2,675,074		\$ 7,029,527		\$ 9,704,602
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 1033kcmil 54/7 ACSS "Curlew"	-	LF	\$ 2.82	\$ -	\$ 5.00	\$ -	\$ 7.82	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	230V - (1) 1033kcmil 54/7 ACSS "Curlew"	33,264	LF	\$ 2.82	\$ 93,804	\$ 5.00	\$ 166,320	\$ 7.82	\$ 260,124
4.6	(1) OPGW 36 Fiber AC-33/38/571	4,435	LF	\$ 1.35	\$ 5,987	\$ 5.00	\$ 22,175	\$ 6.35	\$ 28,162
4.7	(1) 3/8" EHS7 Steel	4,435	LF	\$ 0.47	\$ 2,084	\$ 5.00	\$ 22,175	\$ 5.47	\$ 24,259
4.8	Remove Existing Conductor and Accessories	10.0	Mile	\$ -	\$ -	\$ 30,000	\$ 300,000	\$ 30,000.00	\$ 300,000
4.9	Remove Existing OPGW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.10	Remove Existing OHSW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.11									
4.12	Rider Poles	15	EA	\$ 1,750	\$ 26,250	\$ 3,500	\$ 52,500	\$ 5,250.00	\$ 78,750
4.13	Rider Poles - Relocated	14	Set	\$ -	\$ -	\$ 3,500	\$ 49,000	\$ 3,500.00	\$ 49,000
4.14									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 128,126		\$ 852,170		\$ 980,296
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	230kv/345kv Tangent (1-Group of 18-Bells Each Assembly)	600	Assembly	\$ 1,800	\$ 1,080,000	\$ 720	\$ 432,000	\$ 2,520	\$ 1,512,000
5.2	230kv/345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	210	Assembly	\$ 1,800	\$ 378,000	\$ 720	\$ 151,200	\$ 2,520	\$ 529,200
5.3			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.4	OPGW Assembly - Tangent	100	Assembly	\$ 200	\$ 20,000	\$ 150	\$ 15,000	\$ 350	\$ 35,000
5.5	OPGW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.6	OHSW Assembly - Tangent	100	Assembly	\$ 200	\$ 20,000	\$ 150	\$ 15,000	\$ 350	\$ 35,000
5.7	OHSW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.8	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.9	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.10	Spacer - Conductor	1,038	EA	\$ 50	\$ 51,900	\$ 35	\$ 36,330	\$ 85	\$ 88,230
5.11	Vibration Dampers - Conductor	830	EA	\$ 35	\$ 29,050	\$ 35	\$ 29,050	\$ 70	\$ 58,100
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	210	EA	\$ 27	\$ 5,670	\$ 35	\$ 7,350	\$ 62	\$ 13,020
5.13	Guys, Anchors, and Accessories	64.0	EA	\$ 720	\$ 46,080	\$ 885	\$ 56,640	\$ 1,605	\$ 102,720
5.14	Misc. materials (Signs and Markers)	5.2	Mile	\$ 770	\$ 4,004	\$ 1,006	\$ 5,231	\$ 1,776	\$ 9,235
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,682,833		\$ 794,553		\$ 2,477,386
<b>B. Transmission Line Princetown to Rotterdam</b>					\$ 5,384,005		\$ 17,570,333		\$ 22,954,338
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 229,543	\$ 229,543	\$ 229,543	\$ 229,543
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,166,769	\$ 1,166,769	\$ 1,166,769	\$ 1,166,769
6.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 229,543	\$ 229,543	\$ 229,543	\$ 229,543

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 229,543	\$ 229,543	\$ 229,543	\$ 229,543
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,147,717	\$ 1,147,717	\$ 1,147,717	\$ 1,147,717
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 68,863	\$ 68,863	\$ 68,863	\$ 68,863
6.7	Geotech	5	Location	\$ -	\$ -	\$ 3,500	\$ 17,500	\$ 3,500	\$ 17,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 160,680	\$ 160,680	\$ 160,680	\$ 160,680
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	EA	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 68,863	\$ 68,863	\$ 68,863	\$ 68,863
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 847,000	\$ 847,000	\$ 847,000	\$ 847,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 430,720	\$ 430,720	\$ -	\$ -	\$ 430,720	\$ 430,720
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 22,954	\$ 22,954	\$ 22,954	\$ 22,954
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 430,720		\$ 4,228,977		\$ 4,659,697

**NextEra - T021 Enterprise Line - (Segment A)**

**C. Transmission Line Princetown to New Scotland**

Estimate Revision: 5

Total: \$ 48,710,925

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>C. Transmission Line Princetown to New Scotland</b>			
1. CLEARING & ACCESS	\$ 88,000	\$ 11,773,438	\$ 11,861,438
2. FOUNDATIONS	\$ 257,730	\$ 2,717,364	\$ 2,975,094
3. STRUCTURES	\$ 3,192,349	\$ 12,052,512	\$ 15,244,861
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,212,093	\$ 4,756,290	\$ 6,968,383
5. INSULATORS, FITTINGS, HARDWARE	\$ 2,164,996	\$ 1,023,701	\$ 3,188,698
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 633,213	\$ 7,839,238	\$ 8,472,452
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
SUBTOTAL:	\$ 8,548,381	\$ 40,162,544	\$ 48,710,925
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
TOTAL:	\$ 8,548,381	\$ 40,162,544	\$ 48,710,925

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	40.0	Acre	\$ -	\$ -	\$ 5,000	\$ 200,000	\$ 5,000	\$ 200,000
1.3	Access Road	21,014.4	LF	\$ -	\$ -	\$ 45	\$ 945,648	\$ 45	\$ 945,648
1.4	Silt Fence	105,072.0	LF	\$ -	\$ -	\$ 4	\$ 420,288	\$ 4	\$ 420,288
1.5	Matting - Access and ROW	84,057.6	LF	\$ -	\$ -	\$ 70	\$ 5,884,032	\$ 70	\$ 5,884,032
1.6	Matting - To Work Area	10,275.0	LF	\$ -	\$ -	\$ 70	\$ 719,250	\$ 70	\$ 719,250
1.7	Snow Removal	19.9	LS	\$ -	\$ -	\$ 16,000	\$ 318,400	\$ 16,000	\$ 318,400
1.8	ROW Restoration	19.9	Mile	\$ -	\$ -	\$ 10,000	\$ 199,000	\$ 10,000	\$ 199,000
1.9	Work Pads	685,000.0	SF	\$ -	\$ -	\$ 4	\$ 2,411,200	\$ 4	\$ 2,411,200
1.10	Restoration for Work Pad areas	137,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 20,550	\$ 0	\$ 20,550
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	2.0	EA	\$ -	\$ -	\$ 14,445	\$ 28,890	\$ 14,445	\$ 28,890
1.13	Stabilized Construction Entrance	76.0	EA	\$ -	\$ -	\$ 4,580	\$ 348,080	\$ 4,580	\$ 348,080
1.14	Maintenance and Protection of Traffic on Public Roads	30.0	EA	\$ 750	\$ 22,500	\$ 1,250	\$ 37,500	\$ 2,000	\$ 60,000
1.15	Gates	11.0	EA	\$ 2,000	\$ 22,000	\$ 2,500	\$ 27,500	\$ 4,500	\$ 49,500
1.16	Culverts / Misc. Access	58.0	EA	\$ 750	\$ 43,500	\$ 1,250	\$ 72,500	\$ 2,000	\$ 116,000
1.17	Concrete Washout Station	76.0	EA	\$ -	\$ -	\$ 1,850	\$ 140,600	\$ 1,850	\$ 140,600
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 88,000		\$ 11,773,438		\$ 11,861,438
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV SELF SUPPORT DEADEND, STEEL	3	EA	\$ 72,918	\$ 218,753	\$ 73,699	\$ 221,096	\$ 146,616	\$ 439,849
2.2	Drilled Pier - 345KV VERTICAL D/C TANGENT, STEEL	2	EA	\$ 12,547	\$ 25,095	\$ 12,682	\$ 25,363	\$ 25,229	\$ 50,458
2.3	Drilled Pier - 345KV VERTICAL TANGENT, STEEL	2	EA	\$ 32,128	\$ 64,257	\$ 32,473	\$ 64,945	\$ 64,601	\$ 129,202
2.4	Direct Embed - 345KV DELTA S/C TANGENT, CONCRETE	66	EA	\$ 2,043	\$ 134,855	\$ 13,894	\$ 917,011	\$ 15,937	\$ 1,051,865
2.5	Direct Embed - 345KV VERTICAL TANGENT, CONCRETE	37	EA	\$ 1,881	\$ 69,597	\$ 12,791	\$ 473,260	\$ 14,672	\$ 542,857
2.6	Direct Embed - 345KV RUNNING ANGLE, CONCRETE	5	EA	\$ 1,920	\$ 9,598	\$ 13,053	\$ 65,263	\$ 14,972	\$ 74,861
2.7	Direct Embed - 345KV GUYED DEADEND, CONCRETE	4	EA	\$ 1,800	\$ 7,200	\$ 12,239	\$ 48,957	\$ 14,039	\$ 56,156
2.8	Direct Embed - 345KV VERTICAL D/C TANGENT, CONCRETE	18	EA	\$ 2,027	\$ 36,482	\$ 13,782	\$ 248,074	\$ 15,809	\$ 284,556
2.9	Rock Excavation Adder	482.4	CY	\$ -	\$ -	\$ 2,000	\$ 964,800	\$ 2,000	\$ 964,800
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 257,730		\$ 2,717,364		\$ 2,975,094
<b>3. STRUCTURES</b>									
3.1	345KV D/C CONCRETE VERTICAL TANGENT	18	Structure	\$ 21,737	\$ 391,266	\$ 84,708	\$ 1,524,752	\$ 106,445	\$ 1,916,018
3.2	345KV S/C CONCRETE DELTA TANGENT	66	Structure	\$ 21,214	\$ 1,400,124	\$ 84,051	\$ 5,547,366	\$ 105,265	\$ 6,947,490
3.3	345KV S/C CONCRETE GUYED DEADEND	4	Structure	\$ 17,563	\$ 70,252	\$ 59,114	\$ 236,455	\$ 76,677	\$ 306,707

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.4	345KV S/C CONCRETE GUYED RUNNING ANGLE	5	Structure	\$ 17,563	\$ 87,815	\$ 62,417	\$ 312,086	\$ 79,980	\$ 399,901
3.5	345KV S/C CONCRETE VERTICAL TANGENT	37	Structure	\$ 21,214	\$ 784,918	\$ 84,051	\$ 3,109,887	\$ 105,265	\$ 3,894,805
3.6	345KV S/C STEEL SELF SUPPORTING DEADEND	3	Structure	\$ 80,217	\$ 240,652	\$ 48,130	\$ 144,391	\$ 128,348	\$ 385,043
3.7	345KV S/C STEEL VERTICAL TANGENT	2	Structure	\$ 37,000	\$ 74,000	\$ 22,200	\$ 44,400	\$ 59,200	\$ 118,400
3.8	345KV VERTICAL D/C TANGENT, STEEL	2	Structure	\$ 37,000	\$ 74,000	\$ 22,200	\$ 44,400	\$ 59,200	\$ 118,400
3.9	Remove Existing Foundation	4	EA	\$ -	\$ -	\$ 7,500	\$ 30,000	\$ 7,500	\$ 30,000
3.10	Remove Existing Structure and Accessories	24	EA	\$ -	\$ -	\$ 12,500	\$ 300,000	\$ 12,500	\$ 300,000
3.11	Install Grounding and Grounding Accessories	137	Pole	\$ 506	\$ 69,322	\$ 5,539	\$ 758,775	\$ 6,045	\$ 828,097
3.12									
3.13									
3.14									
3.15									
3.16									
3.17									
3.18									
3.19									
3.20									
<b>TOTAL - STRUCTURES:</b>					\$ 3,192,349		\$ 12,052,512		\$ 15,244,861
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 1033kcmil 54/7 ACSS "Curlew"	661,954	LF	\$ 2.82	\$ 1,866,710	\$ 5.00	\$ 3,309,770	\$ 7.82	\$ 5,176,480
4.2	(1) OPGW 36 Fiber AC-33/38/571	110,326	LF	\$ 1.35	\$ 148,940	\$ 5.00	\$ 551,630	\$ 6.35	\$ 700,570
4.3	(1) 3/8" EHS7 Steel	75,398	LF	\$ 0.47	\$ 35,437	\$ 5.00	\$ 376,990	\$ 5.47	\$ 412,427
4.4	115KV - (1) 1033kcmil 54/7 ACSS "Curlew"	41,580	LF	\$ 2.82	\$ 117,256	\$ 5.00	\$ 207,900	\$ 7.82	\$ 325,156
4.5	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.6	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.7	Remove Existing Conductor and Accessories	2.5	Mile	\$ -	\$ -	\$ 30,000	\$ 75,000	\$ 30,000.00	\$ 75,000
4.8	Remove Existing OPGW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.9	Remove Existing OHSW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.10									
4.11									
4.12	Rider Poles (50 Locations)	25	EA	\$ 1,750	\$ 43,750	\$ 3,500	\$ 87,500	\$ 5,250.00	\$ 131,250
4.13	Rider Poles - Relocated	25	Set	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500.00	\$ 87,500
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,212,093		\$ 4,756,290		\$ 6,968,383
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345KV Tangent (1-Group of 18-Bells Each Assembly)	900	Assembly	\$ 1,800	\$ 1,620,000	\$ 720	\$ 648,000	\$ 2,520	\$ 2,268,000
5.2	345KV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	105	Assembly	\$ 1,800	\$ 189,000	\$ 720	\$ 75,600	\$ 2,520	\$ 264,600
5.3			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.4	OPGW Assembly - Tangent	130	Assembly	\$ 200	\$ 26,000	\$ 150	\$ 19,500	\$ 350	\$ 45,500
5.5	OPGW Assembly - Angle / DE	14	Assembly	\$ 250	\$ 3,500	\$ 150	\$ 2,100	\$ 400	\$ 5,600
5.6	OHSW Assembly - Tangent	130	Assembly	\$ 200	\$ 26,000	\$ 150	\$ 19,500	\$ 350	\$ 45,500
5.7	OHSW Assembly - Angle / DE	14	Assembly	\$ 250	\$ 3,500	\$ 150	\$ 2,100	\$ 400	\$ 5,600
5.8	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.9	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.10	Spacer - Conductor	3,734	EA	\$ 50	\$ 186,700	\$ 35	\$ 130,690	\$ 85	\$ 317,390
5.11	Vibration Dampers - Conductor	896	EA	\$ 35	\$ 31,360	\$ 35	\$ 31,360	\$ 70	\$ 62,720
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	132	EA	\$ 27	\$ 3,564	\$ 35	\$ 4,620	\$ 62	\$ 8,184
5.13	Guys, Anchors, and Accessories	36	EA	\$ 720	\$ 25,920	\$ 885	\$ 31,860	\$ 1,605	\$ 57,780
5.14	Misc. materials (Signs and Markers)	19.9	Mile	\$ 770	\$ 15,323	\$ 1,006	\$ 20,019	\$ 1,776	\$ 35,342
5.15									
5.16									
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 2,164,996		\$ 1,023,701		\$ 3,188,698
<b>C. Transmission Line Princetown to New Scotland</b>						\$ 7,915,168		\$ 32,323,305	\$ 40,238,473
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 402,385	\$ 402,385	\$ 402,385	\$ 402,385
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,045,322	\$ 2,045,322	\$ 2,045,322	\$ 2,045,322
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 402,385	\$ 402,385	\$ 402,385	\$ 402,385
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 402,385	\$ 402,385	\$ 402,385	\$ 402,385
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,011,924	\$ 2,011,924	\$ 2,011,924	\$ 2,011,924
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 120,715	\$ 120,715	\$ 120,715	\$ 120,715
6.7	Geotech	21	Location	\$ -	\$ -	\$ 3,500	\$ 73,500	\$ 3,500	\$ 73,500
6.8	Surveying/Staking	1	Mile	\$ -	\$ -	\$ 281,669	\$ 281,669	\$ 281,669	\$ 281,669
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	EA	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 120,715	\$ 120,715	\$ 120,715	\$ 120,715
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 218,000	\$ 218,000	\$ 218,000	\$ 218,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 1,680,000	\$ 1,680,000	\$ 1,680,000	\$ 1,680,000
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 633,213	\$ 633,213	\$ -	\$ -	\$ 633,213	\$ 633,213
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 40,238	\$ 40,238	\$ 40,238	\$ 40,238
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 633,213		\$ 7,839,238		\$ 8,472,452

**NextEra - T021 Enterprise Line - (Segment A)**

**D. Princetown Substation - Install**

Estimate Revision: **5** Total: \$ **50,824,310**

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>D. Princetown Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 440,750	\$ 3,451,500	\$ 3,892,250
2. SUBSTATION FOUNDATIONS	\$ 3,436,513	\$ 3,680,200	\$ 7,116,713
3. SUBSTATION STRUCTURES	\$ 1,426,720	\$ 1,426,720	\$ 2,853,440
4. MAJOR EQUIPMENT	\$ 8,890,000	\$ 2,540,000	\$ 11,430,000
5. SMALL EQUIPMENT / MATERIALS	\$ 2,338,000	\$ 1,215,000	\$ 3,553,000
6. CONTROL HOUSE / PANELS	\$ 4,021,205	\$ 2,135,205	\$ 6,156,410
7. MISC ITEMS	\$ 1,825,778	\$ 3,468,853	\$ 5,294,631
8. MOB/DEMOP, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,790,317	\$ 8,737,549	\$ 10,527,866
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 24,169,283	\$ 26,655,027	\$ 50,824,310
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 24,169,283	\$ 26,655,027	\$ 50,824,310

0.0%  
0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Princetown Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	9.4	ACRES	\$ -	\$ -	\$ 230,000	\$ 2,156,250	\$ 230,000	\$ 2,156,250
1.2	Station stone within substation fence.	4,000	CY	\$ 27	\$ 108,000	\$ 75	\$ 300,000	\$ 102	\$ 408,000
1.3	Substation Fence	2,400	LF	\$ 100	\$ 240,000	\$ 100	\$ 240,000	\$ 200	\$ 480,000
1.4	Retaining Wall (1065' x 13')			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.5	Compacted Fill (124,583cy Sand)			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.6	Permanent Access Road - 20'-Wide (From Coplon Road)	2,650	LF	\$ 35	\$ 92,750	\$ 285	\$ 755,250	\$ 320	\$ 848,000
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 440,750		\$ 3,451,500		\$ 3,892,250
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	7	EA	\$ 14,940	\$ 104,580	\$ 16,000	\$ 112,000	\$ 30,940	\$ 216,580
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	16	EA	\$ 26,145	\$ 418,320	\$ 28,000	\$ 448,000	\$ 54,145	\$ 866,320
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	108	EA	\$ 4,482	\$ 484,056	\$ 4,800	\$ 518,400	\$ 9,282	\$ 1,002,456
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	122	EA	\$ 4,482	\$ 546,804	\$ 4,800	\$ 585,600	\$ 9,282	\$ 1,132,404
2.1j	Instrument Transformer Stand Foundations	30	EA	\$ 4,482	\$ 134,460	\$ 4,800	\$ 144,000	\$ 9,282	\$ 278,460
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564
2.1n	Misc. Structure Foundations	1	EA	\$ 7,470	\$ 7,470	\$ 8,000	\$ 8,000	\$ 15,470	\$ 15,470

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p	Transformer Firewalls	0	EA	\$ 65,736	\$ -	\$ 70,400	\$ -	\$ 136,136	\$ -
2.1q									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	6	EA	\$ 11,952	\$ 71,712	\$ 12,800	\$ 76,800	\$ 24,752	\$ 148,512
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	20	EA	\$ 22,410	\$ 448,200	\$ 24,000	\$ 480,000	\$ 46,410	\$ 928,200
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	12	EA	\$ 22,410	\$ 268,920	\$ 24,000	\$ 288,000	\$ 46,410	\$ 556,920
2.2e	Switch Stand Foundations	56	EA	\$ 3,735	\$ 209,160	\$ 4,000	\$ 224,000	\$ 7,735	\$ 433,160
2.2f	Station Service Transformer Stand Foundation	4	EA	\$ 3,735	\$ 14,940	\$ 4,000	\$ 16,000	\$ 7,735	\$ 30,940
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	57	EA	\$ 3,735	\$ 212,895	\$ 4,000	\$ 228,000	\$ 7,735	\$ 440,895
2.2j	Instrument Transformer Stand Foundations	30	EA	\$ 3,735	\$ 112,050	\$ 4,000	\$ 120,000	\$ 7,735	\$ 232,050
2.2k	Arrester Stand Foundations	6	EA	\$ 3,735	\$ 22,410	\$ 4,000	\$ 24,000	\$ 7,735	\$ 46,410
2.2m	Wave Trap Stand Foundations	2	EA	\$ 3,735	\$ 7,470	\$ 4,000	\$ 8,000	\$ 7,735	\$ 15,470
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations		EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	2	EA	\$ 97,110	\$ 194,220	\$ 104,000	\$ 208,000	\$ 201,110	\$ 402,220
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad (45' x120')	1	EA	\$ 74,700	\$ 74,700	\$ 80,000	\$ 80,000	\$ 154,700	\$ 154,700
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	10	EA	\$ 5,229	\$ 52,290	\$ 5,600	\$ 56,000	\$ 10,829	\$ 108,290
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 3,436,513		\$ 3,680,200		\$ 7,116,713
<b>3. SUBSTATION STRUCTURES</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	4	EA	\$ 37,000	\$ 148,000	\$ 37,000	\$ 148,000	\$ 74,000	\$ 296,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	18	EA	\$ 14,800	\$ 266,400	\$ 14,800	\$ 266,400	\$ 29,600	\$ 532,800
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	59	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	63	EA	\$ 3,700	\$ 233,100	\$ 3,700	\$ 233,100	\$ 7,400	\$ 466,200
3.1g	Instrument Transformer Stand	30	EA	\$ 1,850	\$ 55,500	\$ 1,850	\$ 55,500	\$ 3,700	\$ 111,000
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	7	EA	\$ 6,475	\$ 45,325	\$ 6,475	\$ 45,325	\$ 12,950	\$ 90,650
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	5	EA	\$ 33,300	\$ 166,500	\$ 33,300	\$ 166,500	\$ 66,600	\$ 333,000
3.2b	Substation A-Frame Structures - Shared Column	4	EA	\$ 33,300	\$ 133,200	\$ 33,300	\$ 133,200	\$ 66,600	\$ 266,400
3.2c	Switch Stands	14	EA	\$ 12,025	\$ 168,350	\$ 12,025	\$ 168,350	\$ 24,050	\$ 336,700
3.2d	Station Service Transformer Stand	1	EA	\$ 12,025	\$ 12,025	\$ 12,025	\$ 12,025	\$ 24,050	\$ 24,050
3.2e	Bus Support 3ph	28	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	29	EA	\$ 2,775	\$ 80,475	\$ 2,775	\$ 80,475	\$ 5,550	\$ 160,950
3.2g	Instrument Transformer Stand	30	EA	\$ 1,295	\$ 38,850	\$ 1,295	\$ 38,850	\$ 2,590	\$ 77,700
3.2h	Arrester Stand	6	EA	\$ 1,295	\$ 7,770	\$ 1,295	\$ 7,770	\$ 2,590	\$ 15,540
3.2j	Wave Trap Stand	2	EA	\$ 5,550	\$ 11,100	\$ 5,550	\$ 11,100	\$ 11,100	\$ 22,200
3.2k	Misc. Structures	3	EA	\$ 6,475	\$ 19,425	\$ 6,475	\$ 19,425	\$ 12,950	\$ 38,850
<b>3.3</b>	<b>115kV</b>								
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 1,426,720		\$ 1,426,720		\$ 2,853,440
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	7	EA	\$ 200,000	\$ 1,400,000	\$ 80,000	\$ 560,000	\$ 280,000	\$ 1,960,000
4.1b	Capacitor Banks with Reactors	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	2	EA	\$ 3,400,000	\$ 6,800,000	\$ 750,000	\$ 1,500,000	\$ 4,150,000	\$ 8,300,000
4.1d	345 kV - 115 kV Auto Transformer	0	EA			\$ 750,000	\$ -	\$ 750,000	\$ -
4.1e									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	6	EA	\$ 115,000	\$ 690,000	\$ 80,000	\$ 480,000	\$ 195,000	\$ 1,170,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers		EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks		EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 8,890,000		\$ 2,540,000		\$ 11,430,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	4	EA	\$ 40,000	\$ 160,000	\$ 15,000	\$ 60,000	\$ 55,000	\$ 220,000
5.1b	Disconnect Switches - 3ph w/ manual operator	14	EA	\$ 35,000	\$ 490,000	\$ 17,500	\$ 245,000	\$ 52,500	\$ 735,000
5.1c	VT'S	6	EA	\$ 25,000	\$ 150,000	\$ 12,000	\$ 72,000	\$ 37,000	\$ 222,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	18	EA	\$ 13,000	\$ 234,000	\$ 8,000	\$ 144,000	\$ 21,000	\$ 378,000
5.1f	Arresters	12	EA	\$ 6,500	\$ 78,000	\$ 1,500	\$ 18,000	\$ 8,000	\$ 96,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	4	EA	\$ 35,000	\$ 140,000	\$ 15,000	\$ 60,000	\$ 50,000	\$ 200,000
5.2b	Disconnect Switches - 3ph w/ manual operator	12	EA	\$ 30,000	\$ 360,000	\$ 17,500	\$ 210,000	\$ 47,500	\$ 570,000
5.2c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.2d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.2e	CCVT'S	18	EA	\$ 10,000	\$ 180,000	\$ 6,000	\$ 108,000	\$ 16,000	\$ 288,000
5.2f	Arresters	12	EA	\$ 5,000	\$ 60,000	\$ 6,000	\$ 72,000	\$ 11,000	\$ 132,000
5.2g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.2h	Station Service Transformers	1	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator		EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator		EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S		EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S		EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S		EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters		EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 2,338,000		\$ 1,215,000		\$ 3,553,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 1,026,000	\$ 1,026,000	\$ 85,000	\$ 85,000	\$ 1,111,000	\$ 1,111,000
6.2	Protection and Telecom Equipment Panels	43	EA	\$ 35,000	\$ 1,505,000	\$ 10,000	\$ 430,000	\$ 45,000	\$ 1,935,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 975,205	\$ 975,205	\$ 975,205	\$ 975,205	\$ 1,950,410	\$ 1,950,410
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 4,021,205		\$ 2,135,205		\$ 6,156,410
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	2,000	LF	\$ 185.00	\$ 370,000	\$ 170.00	\$ 340,000	\$ 355	\$ 710,000
7.2	Rigid Bus, Fittings & Insulators	5,000	LF	\$ 125.07	\$ 625,350	\$ 237.10	\$ 1,185,500	\$ 362	\$ 1,810,850
7.3	Strain Bus, Connectors & Insulators	2,700	LF	\$ 39.30	\$ 106,110	\$ 53.35	\$ 144,045	\$ 93	\$ 250,155
7.4	Grounding System	32,600	LF	\$ 6.93	\$ 225,918	\$ 32.58	\$ 1,062,108	\$ 40	\$ 1,288,026
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.6	Strain Bus Insulators - 230kV	36	EA	\$ 1,400	\$ 50,400	\$ 750	\$ 27,000	\$ 2,150	\$ 77,400
7.7	Strain Bus Insulators - 115kV		EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12	Utility Station Power	1	LS		\$ -	\$ 135,000	\$ 135,000	\$ 135,000	\$ 135,000
7.13	Install new communication tower foundation	1	LS		\$ -	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000
7.14	Relocate existing communication tower	1	LS		\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,825,778		\$ 3,468,853		\$ 5,294,631
<b>D. Princetown Substation - Install</b>					\$ 22,378,966		\$ 17,917,478		\$ 40,296,444
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 402,964	\$ 402,964	\$ 402,964	\$ 402,964
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,048,268	\$ 2,048,268	\$ 2,048,268	\$ 2,048,268
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 402,964	\$ 402,964	\$ 402,964	\$ 402,964
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 402,964	\$ 402,964	\$ 402,964	\$ 402,964
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,223,716	\$ 3,223,716	\$ 3,223,716	\$ 3,223,716
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 282,075	\$ 282,075	\$ 282,075	\$ 282,075
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,007,411	\$ 1,007,411	\$ 1,007,411	\$ 1,007,411
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 120,889	\$ 120,889	\$ 120,889	\$ 120,889
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 792,000	\$ 792,000	\$ 792,000	\$ 792,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,790,317	\$ 1,790,317	\$ -	\$ -	\$ 1,790,317	\$ 1,790,317
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 40,296	\$ 40,296	\$ 40,296	\$ 40,296
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,790,317		\$ 8,737,549		\$ 10,527,866

**NextEra - T021 Enterprise Line - (Segment A)**

**F. Edic Substation - Install**

Estimate Revision: **5**

Total: \$ **2,639,089**

<i>NextEra - T021 Enterprise Line - (Segment A)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>F. Edic Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,025	\$ 5,625	\$ 7,650
2. SUBSTATION FOUNDATIONS	\$ 100,098	\$ 107,200	\$ 207,298
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 280,000	\$ 133,500	\$ 413,500
6. CONTROL HOUSE / PANELS	\$ 173,850	\$ 98,850	\$ 272,700
7. MISC ITEMS	\$ 339,357	\$ 507,880	\$ 847,237
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 91,178	\$ 430,726	\$ 521,904
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,230,908	\$ 1,408,181	\$ 2,639,089
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,230,908	\$ 1,408,181	\$ 2,639,089

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Edic Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,025		\$ 5,625		\$ 7,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundation	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations		EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations		EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2e	Switch Stand Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundation		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations		EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations		EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations		EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment		EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment		EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad		EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation		EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation		EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 100,098		\$ 107,200		\$ 207,298
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone		EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column		EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands		EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand		EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph		EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand		EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand		EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand		EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures		EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone		EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column		EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands		EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand		EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph		EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph		EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand		EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand		EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand		EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures		EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers		EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers		EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks		EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator		EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator		EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S		EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S		EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S		EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters		EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps		EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator		EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator		EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S		EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S		EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S		EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters		EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 280,000		\$ 133,500		\$ 413,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 10,000	\$ 30,000	\$ 45,000	\$ 135,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 68,850	\$ 68,850	\$ 68,850	\$ 68,850	\$ 137,700	\$ 137,700
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 173,850		\$ 98,850		\$ 272,700
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	L.S.	\$ 75,042.00	\$ -	\$ 142,260.00	\$ -	\$ 217,302	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 39.30	\$ 98,250	\$ 53.35	\$ 133,375	\$ 93	\$ 231,625
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 73,305.00	\$ 73,305	\$ 83,700	\$ 83,700
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 339,357		\$ 507,880		\$ 847,237
<b>F. Edic Substation - Install</b>					\$ 1,139,730		\$ 977,455		\$ 2,117,185
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 107,617	\$ 107,617	\$ 107,617	\$ 107,617
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 169,375	\$ 169,375	\$ 169,375	\$ 169,375
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,820	\$ 14,820	\$ 14,820	\$ 14,820
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,930	\$ 52,930	\$ 52,930	\$ 52,930
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,352	\$ 6,352	\$ 6,352	\$ 6,352
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 91,178	\$ 91,178	\$ -	\$ -	\$ 91,178	\$ 91,178
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,117	\$ 2,117	\$ 2,117	\$ 2,117
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 91,178		\$ 430,726		\$ 521,904

**NextEra - T021 Enterprise Line - (Segment A)**

**G. Edic Substation - Removal**

Estimate Revision: **5**

Total: \$ **41,840**

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>G. Edic Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 14,200	\$ 14,200
3. SUBSTATION STRUCTURES	\$ -	\$ 6,750	\$ 6,750
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 10,500	\$ 10,500
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 5,890	\$ 5,890
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 41,840	\$ 41,840
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 41,840	\$ 41,840

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Edic Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 14,200	\$ 14,200	\$ 14,200	\$ 14,200
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 14,200		\$ 14,200
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e									
3.1f	Bus Support 1 Ph	3	EA	\$ -	\$ -	\$ 2,250	\$ 6,750	\$ 2,250	\$ 6,750
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 6,750		\$ 6,750
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 10,500.00	\$ 10,500	\$ 10,500	\$ 10,500
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 10,500		\$ 10,500
<b>G. Edic Substation - Removal</b>					\$ -		\$ 35,950		\$ 35,950
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,827	\$ 1,827	\$ 1,827	\$ 1,827
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 360	\$ 360	\$ 360	\$ 360
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,876	\$ 2,876	\$ 2,876	\$ 2,876
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 252	\$ -	\$ 252	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 899	\$ -	\$ 899	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 108	\$ 108	\$ 108	\$ 108
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ 36	\$ -	\$ 36	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 5,890		\$ 5,890

**NextEra - T021 Enterprise Line - (Segment A)**

**H. New Scotland Substation - Install**

Estimate Revision: **5** Total: \$ **8,384,335**

<i>NextEra - T021 Enterprise Line - (Segment A)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>H. New Scotland Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 30,750	\$ 233,063	\$ 263,813
2. SUBSTATION FOUNDATIONS	\$ 498,996	\$ 534,400	\$ 1,033,396
3. SUBSTATION STRUCTURES	\$ 240,500	\$ 240,500	\$ 481,000
4. MAJOR EQUIPMENT	\$ 1,000,000	\$ 400,000	\$ 1,400,000
5. SMALL EQUIPMENT / MATERIALS	\$ 369,500	\$ 188,000	\$ 557,500
6. CONTROL HOUSE / PANELS	\$ 749,150	\$ 390,400	\$ 1,139,550
7. MISC ITEMS	\$ 897,304	\$ 968,110	\$ 1,865,414
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 302,896	\$ 1,340,767	\$ 1,643,663
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 4,089,096	\$ 4,295,239	\$ 8,384,335
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 4,089,096	\$ 4,295,239	\$ 8,384,335

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. New Scotland Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0.9	ACRES	\$ -	\$ -	\$ 203,000	\$ 190,313	\$ 203,000	\$ 190,313
1.2	Station stone within substation fence.	250	CY	\$ 27	\$ 6,750	\$ 75	\$ 18,750	\$ 102	\$ 25,500
1.3	Substation Fence	240	LF	\$ 100	\$ 24,000	\$ 100	\$ 24,000	\$ 200	\$ 48,000
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 30,750		\$ 233,063		\$ 263,813
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	5	EA	\$ 14,940	\$ 74,700	\$ 16,000	\$ 80,000	\$ 30,940	\$ 154,700
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	18	EA	\$ 4,482	\$ 80,676	\$ 4,800	\$ 86,400	\$ 9,282	\$ 167,076
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	32	EA	\$ 4,482	\$ 143,424	\$ 4,800	\$ 153,600	\$ 9,282	\$ 297,024
2.1j	Instrument Transformer Stand Foundations	15	EA	\$ 4,482	\$ 67,230	\$ 4,800	\$ 72,000	\$ 9,282	\$ 139,230
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 498,996		\$ 534,400		\$ 1,033,396
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	3	EA	\$ 14,800	\$ 44,400	\$ 14,800	\$ 44,400	\$ 29,600	\$ 88,800
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	32	EA	\$ 3,700	\$ 118,400	\$ 3,700	\$ 118,400	\$ 7,400	\$ 236,800
3.1g	Instrument Transformer Stand	15	EA	\$ 1,850	\$ 27,750	\$ 1,850	\$ 27,750	\$ 3,700	\$ 55,500
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 240,500		\$ 240,500		\$ 481,000
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	5	EA	\$ 200,000	\$ 1,000,000	\$ 80,000	\$ 400,000	\$ 280,000	\$ 1,400,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 1,000,000		\$ 400,000		\$ 1,400,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ 35,000	\$ 105,000	\$ 17,500	\$ 52,500	\$ 157,500	\$ 157,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 111,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 63,000	\$ 63,000
5.1e	CCVT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 126,000	\$ 126,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 24,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 369,500		\$ 188,000		\$ 557,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	1	EA	\$ 243,750	\$ 243,750	\$ 42,500	\$ 42,500	\$ 286,250	\$ 286,250
6.2	Protection and Telecom Equipment Panels	7	EA	\$ 35,000	\$ 245,000	\$ 12,500	\$ 87,500	\$ 47,500	\$ 332,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 260,400	\$ 260,400	\$ 260,400	\$ 260,400	\$ 520,800	\$ 520,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 749,150		\$ 390,400		\$ 1,139,550
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	2,500.0	LF	\$ 185.00	\$ 462,500	\$ 170.00	\$ 425,000	\$ 355	\$ 887,500
7.2	Rigid Bus, Fittings & Insulators	700.0	LF	\$ 125.07	\$ 87,549	\$ 237.10	\$ 165,970	\$ 362	\$ 253,519
7.3	Strain Bus, Connectors & Insulators	200.0	LF	\$ 39.30	\$ 7,860	\$ 53.35	\$ 10,670	\$ 93	\$ 18,530
7.4	Grounding System	1,500.0	LF	\$ 6.93	\$ 10,395	\$ 32.58	\$ 48,870	\$ 40	\$ 59,265
7.5	Strain Bus Insulators - 345kV	12	EA	\$ 2,000	\$ 24,000	\$ 1,050	\$ 12,600	\$ 3,050	\$ 36,600
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 897,304		\$ 968,110		\$ 1,865,414
<b>H. New Scotland Substation - Install</b>					\$ 3,786,200		\$ 2,954,473		\$ 6,740,673
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 67,407	\$ 67,407	\$ 67,407	\$ 67,407
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 342,628	\$ 342,628	\$ 342,628	\$ 342,628
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 67,407	\$ 67,407	\$ 67,407	\$ 67,407
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 67,407	\$ 67,407	\$ 67,407	\$ 67,407
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 539,254	\$ 539,254	\$ 539,254	\$ 539,254
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 47,185	\$ 47,185	\$ 47,185	\$ 47,185
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 168,517	\$ 168,517	\$ 168,517	\$ 168,517

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 20,222	\$ 20,222	\$ 20,222	\$ 20,222
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 302,896	\$ 302,896	\$ -	\$ -	\$ 302,896	\$ 302,896
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 6,741	\$ 6,741	\$ 6,741	\$ 6,741
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 302,896		\$ 1,340,767		\$ 1,643,663

**NextEra - T021 Enterprise Line - (Segment A)**

**I. New Scotland Substation - Removal**

Estimate Revision: **5**

Total: \$ **169,052**

<i>NextEra - T021 Enterprise Line - (Segment A)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>I. New Scotland Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 30,000	\$ 30,000
2. SUBSTATION FOUNDATIONS	\$ -	\$ 57,200	\$ 57,200
3. SUBSTATION STRUCTURES	\$ -	\$ 27,000	\$ 27,000
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 7,000	\$ 7,000
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 21,000	\$ 21,000
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 26,852	\$ 26,852
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 169,052	\$ 169,052
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 169,052	\$ 169,052

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. New Scotland Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	200	LF	\$ -	\$ -	\$ 150	\$ 30,000	\$ 150	\$ 30,000
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 30,000		\$ 30,000
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	2	EA	\$ -	\$ -	\$ 14,200	\$ 28,400	\$ 14,200	\$ 28,400
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	12	EA	\$ -	\$ -	\$ 2,400	\$ 28,800	\$ 2,400	\$ 28,800
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 57,200		\$ 57,200
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	12	EA	\$ -	\$ -	\$ 2,250	\$ 27,000	\$ 2,250	\$ 27,000
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 27,000		\$ 27,000
<b>4. MAJOR EQUIPMENT</b>									
4.1	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
4.2	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
4.3	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
5.1	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	1	EA	\$ -	\$ -	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 7,000		\$ 7,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	PANELS	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Protection and Telecom Equipment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 21,000.00	\$ 21,000	\$ 21,000	\$ 21,000
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 21,000		\$ 21,000
<b>I. New Scotland Substation - Removal</b>					\$ -		\$ 142,200		\$ 142,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,422	\$ 1,422	\$ 1,422	\$ 1,422
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 7,228	\$ 7,228	\$ 7,228	\$ 7,228
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,422	\$ 1,422	\$ 1,422	\$ 1,422
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,422	\$ 1,422	\$ 1,422	\$ 1,422
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 11,376	\$ 11,376	\$ 11,376	\$ 11,376
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 995	\$ -	\$ 995	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 3,555	\$ 3,555	\$ 3,555	\$ 3,555
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 427	\$ 427	\$ 427	\$ 427
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 142	\$ -	\$ 142	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 26,852		\$ 26,852

**NextEra - T021 Enterprise Line - (Segment A)**

**J. Porter Substation - Install**

Estimate Revision: **5**

Total: \$ **101,268**

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ 15,008	\$ 56,904	\$ 71,912
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,201	\$ 28,155	\$ 29,355
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 16,209	\$ 85,059	\$ 101,268
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 16,209	\$ 85,059	\$ 101,268

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Porter Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Fuse Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Fuse Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -	\$ -	\$ -	\$ -	\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Fuse Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Fuse Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200	\$ -	\$ 80,000	\$ -	\$ 80,200	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j	Fuses	0	EA	\$ 15,000	\$ -	\$ 7,500	\$ -	\$ 22,500	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment	0	EA	\$ 35,000	\$ -	\$ 12,500	\$ -	\$ 47,500	\$ -
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ 15,008.40	\$ 15,008	\$ 56,904.00	\$ 56,904	\$ 71,912	\$ 71,912
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.11	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>J. Porter Substation - Install</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,655	\$ 3,655	\$ 3,655	\$ 3,655
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 719	\$ 719	\$ 719	\$ 719
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,753	\$ 5,753	\$ 5,753	\$ 5,753
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 503	\$ 503	\$ 503	\$ 503
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,798	\$ 1,798	\$ 1,798	\$ 1,798
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 216	\$ 216	\$ 216	\$ 216
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,201	\$ 1,201	\$ -	\$ -	\$ 1,201	\$ 1,201
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 72	\$ 72	\$ 72	\$ 72
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,201		\$ 28,155		\$ 29,355

**NextEra - T021 Enterprise Line - (Segment A)**

**K. Porter Substation - Removal**

Estimate Revision: **5** Total: \$ **552,493**

<i>NextEra - T021 Enterprise Line - (Segment A)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>K. Porter Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 126,600	\$ 126,600
3. SUBSTATION STRUCTURES	\$ -	\$ 206,100	\$ 206,100
4. MAJOR EQUIPMENT	\$ -	\$ 43,500	\$ 43,500
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 59,500	\$ 59,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 38,613	\$ 38,613
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 78,181	\$ 78,181
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 552,493	\$ 552,493
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 552,493	\$ 552,493

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Porter Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	3	EA	\$ -	\$ -	\$ 7,200	\$ 21,600	\$ 7,200	\$ 21,600
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	5	EA	\$ -	\$ -	\$ 5,200	\$ 26,000	\$ 5,200	\$ 26,000
2.2f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	4	EA	\$ -	\$ -	\$ 2,400	\$ 9,600	\$ 2,400	\$ 9,600
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad (40'x125')	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 126,600		\$ 126,600
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	6	EA	\$ -	\$ -	\$ 9,750	\$ 58,500	\$ 9,750	\$ 58,500
3.2d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 206,100		\$ 206,100
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	3	EA	\$ -	\$ -	\$ 14,500	\$ 43,500	\$ 14,500	\$ 43,500
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 43,500		\$ 43,500
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	2	EA	\$ -	\$ -	\$ 5,500	\$ 11,000	\$ 5,500	\$ 11,000
5.2b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2c	VT'S	2	EA	\$ -	\$ -	\$ 1,500	\$ 3,000	\$ 1,500	\$ 3,000
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	6	EA	\$ -	\$ -	\$ 1,500	\$ 9,000	\$ 1,500	\$ 9,000
5.2f	Arresters	6	EA	\$ -	\$ -	\$ 2,500	\$ 15,000	\$ 2,500	\$ 15,000
5.2g	Wave Traps	2	EA	\$ -	\$ -	\$ 2,500	\$ 5,000	\$ 2,500	\$ 5,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 59,500		\$ 59,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	PANELS	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Protection and Telecom Equipment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ -	\$ -	\$ 18,937.50	\$ 18,938	\$ 18,938	\$ 18,938
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ -	\$ -	\$ 19,675.00	\$ 19,675	\$ 19,675	\$ 19,675
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 38,613		\$ 38,613
<b>K. Porter Substation - Removal</b>					\$ -		\$ 474,313		\$ 474,313
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 24,109	\$ 24,109	\$ 24,109	\$ 24,109
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 37,945	\$ 37,945	\$ 37,945	\$ 37,945
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 3,320	\$ -	\$ 3,320	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 11,858	\$ -	\$ 11,858	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,423	\$ 1,423	\$ 1,423	\$ 1,423
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 474	\$ 474	\$ 474	\$ 474
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 78,181		\$ 78,181

**NextEra - T021 Enterprise Line - (Segment A)**

**L. Interconnection Edic Station**

Estimate Revision: **5** Total: \$ **2,126,997**

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>L. Interconnection Edic Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 168,366	\$ 170,169	\$ 338,536
3. STRUCTURES	\$ 501,469	\$ 321,821	\$ 823,289
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 160,000	\$ 94,400	\$ 254,400
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 66,387	\$ 276,535	\$ 342,922
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,230,776</b>	\$ <b>2,126,997</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,230,776</b>	\$ <b>2,126,997</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Edic Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ -	\$ 367,850	\$ -	\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 27’	3	EA	\$ 41,332	\$ 123,995	\$ 41,774	\$ 125,322	\$ 83,106	\$ 249,317
2.2	Foundation – Drilled Pier – 8’X 29’	1	EA	\$ 44,372	\$ 44,372	\$ 44,847	\$ 44,847	\$ 89,219	\$ 89,219
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 168,366		\$ 170,169		\$ 338,536
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) – 105'	3	Structure	\$ 98,883	\$ 296,648	\$ 59,330	\$ 177,989	\$ 158,212	\$ 474,636
3.2	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.3	Install Grounding and Grounding Accessories	4	Pole	\$ 506	\$ 2,024	\$ 5,539	\$ 22,154	\$ 6,045	\$ 24,178
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES</b>					\$ 501,469		\$ 321,821		\$ 823,289
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 3.53	\$ -	\$ 5.00	\$ -	\$ 8.53	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.55	\$ -	\$ 5.00	\$ -	\$ 6.55	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.72	\$ -	\$ 5.00	\$ -	\$ 5.72	\$ -
4.5	Remove Existing Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)								
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)								
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)								
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.11	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15									
5.16									
5.17									
5.18									
5.19	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 160,000		\$ 94,400		\$ 254,400
<b>L. Interconnection Edic Station</b>					\$ 829,835		\$ 954,240		\$ 1,784,075
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 90,685	\$ 90,685	\$ 90,685	\$ 90,685
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 89,204	\$ 89,204	\$ 89,204	\$ 89,204
6.6	LiDAR	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	Geotech	1	LS	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,489	\$ 12,489	\$ 12,489	\$ 12,489
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	EA	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,352	\$ 5,352	\$ 5,352	\$ 5,352
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 66,387	\$ 66,387	\$ -	\$ -	\$ 66,387	\$ 66,387
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 1,784	\$ 1,784	\$ 1,784	\$ 1,784
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 66,387		\$ 276,535		\$ 342,922

**NextEra - T021 Enterprise Line - (Segment A)**

**M. Interconnection New Scotland Station**

Estimate Revision: **5** Total: \$ **3,108,364**

NextEra - T021 Enterprise Line - (Segment A)			
	Supply	Installation	Total
<b>M. Interconnection New Scotland Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 365,657	\$ 473,093	\$ 838,749
3. STRUCTURES	\$ 655,465	\$ 445,628	\$ 1,101,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,555	\$ 26,100	\$ 29,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 161,130	\$ 95,795	\$ 256,925
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 94,864	\$ 419,228	\$ 514,093
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,827,693</b>	<b>\$ 3,108,364</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,827,693</b>	<b>\$ 3,108,364</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection New Scotland Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 50’	3	EA	\$ 76,500	\$ 229,501	\$ 77,320	\$ 231,959	\$ 153,820	\$ 461,459
2.2	Foundation – Drilled Pier – 8’X 89’	1	EA	\$ 136,156	\$ 136,156	\$ 137,614	\$ 137,614	\$ 273,770	\$ 273,770
2.3	Rock Excavation Adder	51.8	CY	\$ -	\$ -	\$ 2,000	\$ 103,520	\$ 2,000	\$ 103,520
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 365,657		\$ 473,093		\$ 838,749
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	3	Structure	\$ 178,026	\$ 534,077	\$ 106,815	\$ 320,446	\$ 284,841	\$ 854,522
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	Install Grounding and Grounding Accessories	10	Structure	\$ 506	\$ 5,060	\$ 5,539	\$ 55,385	\$ 6,045	\$ 60,445
3.4					\$ -		\$ -		
3.5									
3.6					\$ -		\$ -		
3.7					\$ -		\$ -		
3.8					\$ -		\$ -		
3.9					\$ -		\$ -		
3.10					\$ -		\$ -		
3.11					\$ -		\$ -		
3.12					\$ -		\$ -		
3.13					\$ -		\$ -		
3.14					\$ -		\$ -		
3.15					\$ -		\$ -		
<b>TOTAL - STRUCTURES</b>					\$ 655,465		\$ 445,628		\$ 1,101,092
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	1,500	LF	\$ 1.90	\$ 2,850	\$ 5.00	\$ 7,500	\$ 6.90	\$ 10,350
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	1,500	LF	\$ 0.47	\$ 705	\$ 5.00	\$ 7,500	\$ 5.47	\$ 8,205
4.5	Remove Existing 345kV Cable From Existing Structures	0.3	Mile	\$ -	\$ -	\$ 30,000	\$ 7,500	\$ 30,000.00	\$ 7,500
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	0.3	Mile	\$ -	\$ -	\$ 12,000	\$ 3,600	\$ 12,000.00	\$ 3,600
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,555		\$ 26,100		\$ 29,655
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	9	EA	\$ 50	\$ 450	\$ 35	\$ 315	\$ 85	\$ 765
5.11	Vibration Dampers - Conductor	48	EA	\$ 35	\$ 1,680	\$ 35	\$ 1,680	\$ 70	\$ 3,360
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15					\$ -		\$ -		\$ -
5.16	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19					\$ -		\$ -		\$ -
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 161,130		\$ 95,795		\$ 256,925
<b>M. Interconnection New Scotland Station</b>									
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
Contractor Mobilization / Demobilization									
					\$ 1,185,806		\$ 1,408,465		\$ 2,594,271

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 131,867	\$ 131,867	\$ 131,867	\$ 131,867
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 129,714	\$ 129,714	\$ 129,714	\$ 129,714
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 18,160	\$ 18,160	\$ 18,160	\$ 18,160
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 94,864	\$ 94,864	\$ -	\$ -	\$ 94,864	\$ 94,864
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,594	\$ 2,594	\$ 2,594	\$ 2,594
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 94,864	\$ 419,228	\$ 419,228	\$ 514,093	\$ 514,093

**NextEra - T021 Enterprise Line - (Segment A)**

**J. Porter Substation - Install**

Estimate Revision: **5** Total: \$ **1,051,306**

<i>NextEra - T021 Enterprise Line - (Segment A)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ 425,000	\$ 425,000	\$ 850,000
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 34,000	\$ 167,306	\$ 201,306
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 459,000	\$ 592,306	\$ 1,051,306
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 459,000	\$ 592,306	\$ 1,051,306

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Porter Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Fuse Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2f	Fuse Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ -		\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Fuse Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Fuse Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200	\$ -	\$ 80,000	\$ -	\$ 80,200	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j	Fuses	0	EA	\$ 15,000	\$ -	\$ 7,500	\$ -	\$ 22,500	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>									
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment	1	L.S.	\$ 425,000	\$ 425,000	\$ 425,000	\$ 425,000	\$ 850,000	\$ 850,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>									
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	LS	\$ 15,008.40	\$ -	\$ 56,904.00	\$ -	\$ 71,912	\$ -
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.11	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>									
<b>J. Porter Substation - Install</b>									
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 8,500	\$ 8,500	\$ 8,500	\$ 8,500
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 43,206	\$ 43,206	\$ 43,206	\$ 43,206
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 8,500	\$ 8,500	\$ 8,500	\$ 8,500
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 8,500	\$ 8,500	\$ 8,500	\$ 8,500
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 68,000	\$ 68,000	\$ 68,000	\$ 68,000
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 5,950	\$ 5,950	\$ 5,950	\$ 5,950
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 21,250	\$ 21,250	\$ 21,250	\$ 21,250

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 2,550	\$ 2,550	\$ 2,550	\$ 2,550
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 34,000	\$ 34,000	\$ -	\$ -	\$ 34,000	\$ 34,000
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 850	\$ 850	\$ 850	\$ 850
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 34,000		\$ 167,306		\$ 201,306

**NextEra - T021 Enterprise Line - (Segment A)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 4.347% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.

NY Power Authority and North American Transmission (T025)			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$54,770
	1.2	Foundations	\$35,794
	1.3	Structures	\$67,800
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$37,454
	1.5	Insulators, Fitting and Hardwares	\$13,068
	Subtotal (1)		<b>\$208,887</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$47,629
	2.2	Edic Substation	\$2,153
	2.3	Princetown Substation	\$12,713
	2.4	New Scotland Substation	\$0
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$67,167
	2.7	Marcy Substation	\$17,553
2.8	Substation Interconnections	\$8,301	
Subtotal (2)		<b>\$156,062</b>	
Total (1+2)		\$364,949	
Contractors Mark-up (15% of Total 1+2)		\$54,742	
Total Direct Cost (A)		<b>\$419,691</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$3,649
	3.2	Project Management, Material Handling & Amenities	\$20,483
	3.3	Engineering	\$26,265
	3.4	Testing & Commissioning	\$3,851
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$28,307
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$9,589
Total Indirect Cost (3)		<b>\$101,064</b>	
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$520,756</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	NUF proposed as element of the Project (Marcy and Edic Terminals)	\$7,727
	4.2	NUF identified during Evaluation (765kV Corona Mitigation)	\$116,005
Subtotal NUF Cost (C)		<b>\$123,731</b>	
<b>Total Project Cost (B+C) 2017 \$</b>		<b>\$644,487</b>	
<b>Total Project Cost 2018 \$</b>		<b>\$663,822</b>	

**NAT & NYPA - T025 - (Segment A, + 765kV)**

Estimate Revision: 7

<i>NAT &amp; NYPA - T025 - (Segment A, + 765kV) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Edic to Princetown	\$ 122,946,653
Direct Labor, Material & Equipment Costs	A1. Marcy Interconnect & New Scotland SS Loop	\$ 27,109,751
Direct Labor, Material & Equipment Costs	B. Transmission Line Princetown to Rotterdam	\$ 20,488,282
Direct Labor, Material & Equipment Costs	C. Transmission Line Princetown to New Scotland	\$ 38,342,499
Direct Labor, Material & Equipment Costs	D. Rotterdam Substation - Install	\$ 44,017,974
Direct Labor, Material & Equipment Costs	E. Rotterdam Substation - Removal	\$ 3,611,030
Direct Labor, Material & Equipment Costs	F. Edic Substation - Install	\$ 2,117,185
Direct Labor, Material & Equipment Costs	G. Edic Substation - Removal	\$ 35,950
Direct Labor, Material & Equipment Costs	H. Princetown Substation - Install	\$ 12,713,164
Direct Labor, Material & Equipment Costs	I.	\$ -
Direct Labor, Material & Equipment Costs	J. Porter Substation - Install	\$ 71,912
Direct Labor, Material & Equipment Costs	K. Porter Substation - Removal	\$ 474,313
Direct Labor, Material & Equipment Costs	L. Interconnection Edic Station	\$ 1,784,075
Direct Labor, Material & Equipment Costs	M. Interconnection New Scotland Station	\$ 2,594,271
Direct Labor, Material & Equipment Costs	N. Interconnection Rotterdam Station	\$ 3,922,412
Direct Labor, Material & Equipment Costs	O. System Upgrade Facilities (765kV Corona Mitigation)	\$ 82,860,450
Direct Labor, Material & Equipment Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 5,519,000
Direct Labor, Material & Equipment Costs	Q. Knickerbocker Substation - Install	\$ 67,167,025
Direct Labor, Material & Equipment Costs	R. Marcy Substation - Install	\$ 17,552,506
<b>SUBTOTAL:</b>		\$ 453,328,452
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		\$ 67,999,268
<b>CONTINGENCY ON ENTIRE PROJECT</b>		\$ -
<b>TOTAL DIRECT:</b>		\$ 521,327,720

<i>NAT &amp; NYPA - T025 - (Segment A, + 765kV) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Edic to Princetown	\$ 36,074,996
	A1. Marcy Interconnect & New Scotland SS Loop	\$ 7,071,214
Indirect Costs	B. Transmission Line Princetown to Rotterdam	\$ 4,232,179
Indirect Costs	C. Transmission Line Princetown to New Scotland	\$ 8,706,295
Indirect Costs	D. Rotterdam Substation - Install	\$ 10,243,358
Indirect Costs	E. Rotterdam Substation - Removal	\$ 542,106
Indirect Costs	F. Edic Substation - Install	\$ 490,771
Indirect Costs	G. Edic Substation - Removal	\$ 5,361
Indirect Costs	H. Princetown Substation - Install	\$ 3,058,558
Indirect Costs	I.	\$ -
Indirect Costs	J. Porter Substation - Install	\$ 14,298
Indirect Costs	K. Porter Substation - Removal	\$ 70,732
Indirect Costs	L. Interconnection Edic Station	\$ 316,687
Indirect Costs	M. Interconnection New Scotland Station	\$ 475,944
Indirect Costs	N. Interconnection Rotterdam Station	\$ 631,545
Indirect Costs	O. System Upgrade Facilities (765kV Corona Mitigation)	\$ 20,715,113
Indirect Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 1,380,000
Indirect Costs	Q. Knickerbocker Substation - Install	\$ 15,567,255
Indirect Costs	R. Marcy Substation - Install	\$ 3,973,633
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lisc. & Permit., and Envir. Mitagation)	\$ 9,589,464
<b>TOTAL INDIRECT:</b>		\$ 123,159,508
<b>TOTAL ESTIMATED COST:</b>		\$ 644,487,228

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**A. Transmission Line Edic to Princetown**

Estimate Revision: **7**

**Total: \$ 159,021,649**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>A. Transmission Line Edic to Princetown</b>			
1. CLEARING & ACCESS	\$ 41,500	\$ 35,680,876	\$ 35,722,376
2. FOUNDATIONS	\$ 3,098,282	\$ 10,723,946	\$ 13,822,229
3. STRUCTURES	\$ 14,839,646	\$ 25,190,231	\$ 40,029,876
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 4,932,087	\$ 20,895,790	\$ 25,827,877
5. INSULATORS, FITTINGS, HARDWARE	\$ 5,125,311	\$ 2,418,984	\$ 7,544,295
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,242,946	\$ 33,832,050	\$ 36,074,996
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 30,279,773</b>	<b>\$ 128,741,877</b>	<b>\$ 159,021,649</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 30,279,773</b>	<b>\$ 128,741,877</b>	<b>\$ 159,021,649</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Edic to Princetown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	8.0	Acre	\$ -	\$ -	\$ 15,000	\$ 120,000	\$ 15,000	\$ 120,000
1.2	Clearing the ROW - Light (mowing)	194.0	Acre		\$ -	\$ 5,000	\$ 970,000	\$ 5,000	\$ 970,000
1.3	Permanent Access Road	70,540.8	LF	\$ -	\$ -	\$ 45	\$ 3,174,336	\$ 45	\$ 3,174,336
1.4	Silt Fence	352,704.0	LF	\$ -	\$ -	\$ 4	\$ 1,410,816	\$ 4	\$ 1,410,816
1.5	Matting - Access and ROW	282,163.2	LF	\$ -	\$ -	\$ 70	\$ 19,751,424	\$ 70	\$ 19,751,424
1.6	Matting - To Work Area	25,200.0	LF	\$ -	\$ -	\$ 70	\$ 1,764,000	\$ 70	\$ 1,764,000
1.7	Snow Removal	66.8	Mile	\$ -	\$ -	\$ 16,000	\$ 1,068,800	\$ 16,000	\$ 1,068,800
1.8	ROW Restoration	66.8	Mile	\$ -	\$ -	\$ 10,000	\$ 668,000	\$ 10,000	\$ 668,000
1.9	Work Pads	1,680,000.0	SF	\$ -	\$ -	\$ 4	\$ 5,913,600	\$ 4	\$ 5,913,600
1.10	Restoration for Work Pad areas	336,000.0	SF	\$ -	\$ -	\$ 0.15	\$ 50,400	\$ 0	\$ 50,400
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	50	EA	\$ -	\$ -	\$ 4,580	\$ 229,000	\$ 4,580	\$ 229,000
1.14	Maintenance and Protection of Traffic on Public Roads	100	EA	\$ -	\$ -	\$ 4,130	\$ 413,000	\$ 4,130	\$ 413,000
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	17	EA	\$ 2,000	\$ 34,000	\$ 2,500	\$ 42,500	\$ 4,500	\$ 76,500
1.17	Concrete Washout Station	50	EA	\$ -	\$ -	\$ 1,850	\$ 92,500	\$ 1,850	\$ 92,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 41,500		\$ 35,680,876		\$ 35,722,376
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 4' x 16'	416	EA	\$ 941	\$ 391,345	\$ 7,398	\$ 3,077,513	\$ 8,339	\$ 3,468,858
2.2	Direct Embed Foundations - 4' x 17'	2	EA	\$ 995	\$ 1,990	\$ 7,833	\$ 15,666	\$ 8,828	\$ 17,656
2.3	Direct Embed Foundations - 4' x 19'	52	EA	\$ 1,104	\$ 57,404	\$ 8,703	\$ 452,576	\$ 9,807	\$ 509,979
2.4	Direct Embed Foundations - 4' x 21'	4	EA	\$ 1,213	\$ 4,851	\$ 9,574	\$ 38,295	\$ 10,786	\$ 43,146
2.5	Direct Embed Foundations - 4' x 23'	16	EA	\$ 1,322	\$ 21,144	\$ 10,444	\$ 167,105	\$ 11,766	\$ 188,249
2.6	Direct Embed Foundations - 4' x 25'	4	EA	\$ 1,430	\$ 5,721	\$ 11,314	\$ 45,258	\$ 12,745	\$ 50,979
2.7	Direct Embed Foundations - 6' x 18'	6	EA	\$ 1,857	\$ 11,145	\$ 18,603	\$ 111,621	\$ 20,461	\$ 122,766
2.8	Direct Embed Foundations - 6' x 19'	6	EA	\$ 1,952	\$ 11,711	\$ 19,583	\$ 117,496	\$ 21,534	\$ 129,207
2.9	Direct Embed Foundations - 6' x 20'	14	EA	\$ 2,046	\$ 28,648	\$ 20,562	\$ 287,864	\$ 22,608	\$ 316,512
2.10	Direct Embed Foundations - 6' x 21'	15	EA	\$ 2,141	\$ 32,110	\$ 21,541	\$ 323,113	\$ 23,681	\$ 355,222
2.11	Direct Embed Foundations - 6' x 22'	7	EA	\$ 2,235	\$ 15,645	\$ 22,520	\$ 157,640	\$ 24,755	\$ 173,285
2.12	Direct Embed Foundations - 6' x 25'	6	EA	\$ 2,518	\$ 15,109	\$ 25,457	\$ 152,744	\$ 27,976	\$ 167,854
2.13	Direct Embed Foundations - 6' x 26'	1	EA	\$ 2,613	\$ 2,613	\$ 26,437	\$ 26,437	\$ 29,049	\$ 29,049
2.14	Direct Embed Foundations - 6' x 28'	3	EA	\$ 2,707	\$ 8,121	\$ 27,416	\$ 82,247	\$ 30,123	\$ 90,368
2.15	Direct Embed Foundations - 6' x 29'	3	EA	\$ 2,896	\$ 8,687	\$ 29,374	\$ 88,122	\$ 32,270	\$ 96,809
2.16	Direct Embed Foundations - 6' x 33'	3	EA	\$ 3,273	\$ 9,820	\$ 33,290	\$ 99,871	\$ 36,564	\$ 109,691
2.17	Direct Embed Foundations - 7' x 27'	2	EA	\$ 3,337	\$ 6,673	\$ 37,316	\$ 74,631	\$ 40,652	\$ 81,305
2.18	Direct Embed Foundations - 7' x 28'	1	EA	\$ 3,452	\$ 3,452	\$ 38,648	\$ 38,648	\$ 42,101	\$ 42,101
2.19	Direct Embed Foundations - 7' x 49'	1	EA	\$ 5,880	\$ 5,880	\$ 66,635	\$ 66,635	\$ 72,515	\$ 72,515

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.20	Direct Embed Foundations - 7' x 61'	1	EA	\$ 7,267	\$ 7,267	\$ 82,628	\$ 82,628	\$ 89,894	\$ 89,894
2.21	Drilled Pier - 6' x 20'	54	EA	\$ 18,064	\$ 975,459	\$ 18,261	\$ 986,079	\$ 36,325	\$ 1,961,539
2.22	Drilled Pier - 7' x 19'	15	EA	\$ 23,416	\$ 351,246	\$ 23,671	\$ 355,070	\$ 47,088	\$ 706,315
2.23	Drilled Pier - 7' x 21'	12	EA	\$ 25,758	\$ 309,096	\$ 26,038	\$ 312,461	\$ 51,796	\$ 621,558
2.24	Drilled Pier - 7' x 22'	6	EA	\$ 26,929	\$ 161,573	\$ 27,222	\$ 163,332	\$ 54,151	\$ 324,905
2.26	Drilled Pier - 7' x 23'	3	EA	\$ 28,100	\$ 84,299	\$ 28,406	\$ 85,217	\$ 56,505	\$ 169,516
2.27	Drilled Pier - 7' x 33'	6	EA	\$ 39,808	\$ 238,847	\$ 40,241	\$ 241,447	\$ 80,049	\$ 480,295
2.28	Drilled Pier - 7' x 42'	3	EA	\$ 50,345	\$ 151,036	\$ 50,893	\$ 152,680	\$ 101,239	\$ 303,716
2.29	Drilled Pier - 8' x 27'	2	EA	\$ 42,819	\$ 85,637	\$ 57,340	\$ 114,680	\$ 100,158	\$ 200,317
2.30	Drilled Pier - 8' x 29'	2	EA	\$ 45,877	\$ 91,754	\$ 61,436	\$ 122,871	\$ 107,313	\$ 214,625
2.31	Rock Excavation Adder	1,342	CY	\$ -	\$ -	\$ 2,000	\$ 2,684,000	\$ 2,000	\$ 2,684,000
<b>TOTAL - FOUNDATIONS:</b>					\$ 3,098,282		\$ 10,723,946		\$ 13,822,229
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 50,024	\$ 350,168	\$ 30,014	\$ 210,101	\$ 80,038	\$ 560,269
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 120'	4	Structure	\$ 52,207	\$ 208,828	\$ 31,324	\$ 125,297	\$ 83,531	\$ 334,125
3.3	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 130'	3	Structure	\$ 58,257	\$ 174,770	\$ 34,954	\$ 104,862	\$ 93,210	\$ 279,631
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 135'	10	Structure	\$ 60,884	\$ 608,835	\$ 36,530	\$ 365,301	\$ 97,414	\$ 974,136
3.5	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 145'	1	Structure	\$ 64,473	\$ 64,473	\$ 38,684	\$ 38,684	\$ 103,156	\$ 103,156
3.6	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 115'	1	Structure	\$ 72,039	\$ 72,039	\$ 43,223	\$ 43,223	\$ 115,262	\$ 115,262
3.7	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 130'	3	Structure	\$ 85,082	\$ 255,245	\$ 51,049	\$ 153,147	\$ 136,130	\$ 408,391
3.8	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 135'	1	Structure	\$ 92,278	\$ 92,278	\$ 55,367	\$ 55,367	\$ 147,645	\$ 147,645
3.9	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.10	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 120'	1	Structure	\$ 127,558	\$ 127,558	\$ 76,535	\$ 76,535	\$ 204,092	\$ 204,092
3.11	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 150'	1	Structure	\$ 208,033	\$ 208,033	\$ 124,820	\$ 124,820	\$ 332,852	\$ 332,852
3.12	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 160'	1	Structure	\$ 238,595	\$ 238,595	\$ 143,157	\$ 143,157	\$ 381,751	\$ 381,751
3.13	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 75'	1	Structure	\$ 24,476	\$ 24,476	\$ 14,685	\$ 14,685	\$ 39,161	\$ 39,161
3.14	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 80'	2	Structure	\$ 25,826	\$ 51,652	\$ 15,496	\$ 30,991	\$ 41,322	\$ 82,643
3.15	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 84'	169	Structure	\$ 29,526	\$ 4,989,894	\$ 17,716	\$ 2,993,936	\$ 47,242	\$ 7,983,830
3.16	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 89'	36	Structure	\$ 32,708	\$ 1,177,488	\$ 19,625	\$ 706,493	\$ 52,333	\$ 1,883,981
3.17	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 93'	23	Structure	\$ 34,540	\$ 794,409	\$ 20,724	\$ 476,645	\$ 55,263	\$ 1,271,054
3.18	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 98'	10	Structure	\$ 37,500	\$ 374,995	\$ 22,500	\$ 224,997	\$ 59,999	\$ 599,992
3.19	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 102'	4	Structure	\$ 43,901	\$ 175,602	\$ 26,340	\$ 105,361	\$ 70,241	\$ 280,963
3.20	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 107'	2	Structure	\$ 45,936	\$ 91,871	\$ 27,561	\$ 55,123	\$ 73,497	\$ 146,994
3.21	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 80'	2	Structure	\$ 55,241	\$ 110,482	\$ 33,145	\$ 66,289	\$ 88,386	\$ 176,771
3.22	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 85'	19	Structure	\$ 57,813	\$ 1,098,438	\$ 34,688	\$ 659,063	\$ 92,500	\$ 1,757,500
3.23	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 90'	2	Structure	\$ 61,050	\$ 122,100	\$ 36,630	\$ 73,260	\$ 97,680	\$ 195,360
3.24	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 95'	2	Structure	\$ 65,120	\$ 130,240	\$ 39,072	\$ 78,144	\$ 104,192	\$ 208,384
3.25	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 100'	1	Structure	\$ 68,635	\$ 68,635	\$ 41,181	\$ 41,181	\$ 109,816	\$ 109,816
3.26	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 105'	1	Structure	\$ 72,872	\$ 72,872	\$ 43,723	\$ 43,723	\$ 116,594	\$ 116,594
3.27	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 75'	2	Structure	\$ 61,513	\$ 123,025	\$ 36,908	\$ 73,815	\$ 98,420	\$ 196,840
3.28	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 80'	3	Structure	\$ 69,079	\$ 207,237	\$ 41,447	\$ 124,342	\$ 110,526	\$ 331,579
3.29	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 85'	4	Structure	\$ 75,739	\$ 302,956	\$ 45,443	\$ 181,774	\$ 121,182	\$ 484,730
3.30	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 90'	4	Structure	\$ 48,896	\$ 325,970	\$ 48,896	\$ 195,582	\$ 130,388	\$ 521,552
3.31	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 80'	1	Structure	\$ 97,403	\$ 97,403	\$ 58,442	\$ 58,442	\$ 155,844	\$ 155,844
3.32	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 85'	6	Structure	\$ 105,802	\$ 634,809	\$ 63,481	\$ 380,885	\$ 169,282	\$ 1,015,694
3.33	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 90'	6	Structure	\$ 117,253	\$ 703,518	\$ 70,352	\$ 422,111	\$ 187,605	\$ 1,125,629
3.34	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 95'	1	Structure	\$ 129,408	\$ 129,408	\$ 77,645	\$ 77,645	\$ 207,052	\$ 207,052
3.35	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 178,026	\$ 178,026	\$ 106,815	\$ 106,815	\$ 284,841	\$ 284,841
3.36	Remove Existing Foundation	50	EA	\$ -	\$ -	\$ 7,500	\$ 375,000	\$ 7,500	\$ 375,000
3.37	Remove Existing Structure and Accessories	994	EA	\$ -	\$ -	\$ 12,500	\$ 12,425,000	\$ 12,500	\$ 12,425,000
3.38	Install Grounding and Grounding Accessories	666	Pole	\$ 506	\$ 336,996	\$ 5,539	\$ 3,688,641	\$ 6,045	\$ 4,025,637
<b>TOTAL - STRUCTURES:</b>					\$ 14,839,646		\$ 25,190,231		\$ 40,029,876
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	2,228,688	LF	\$ 1.90	\$ 4,234,507	\$ 5.00	\$ 11,143,440	\$ 6.90	\$ 15,377,947
4.2	(1) OPGW 36 Fiber AC-33/38/571	301,594	LF	\$ 1.35	\$ 407,152	\$ 5.00	\$ 1,507,970	\$ 6.35	\$ 1,915,122

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
4.3	(1) 3/8" EHS7 Steel	271,656	LF	\$ 0.47	\$ 127,678	\$ 5.00	\$ 1,358,280	\$ 5.47	\$ 1,485,958
4.4									
4.5									
4.6									
4.7	Remove Existing Conductor and Accessories	121.0	Mile	\$ -	\$ -	\$ 30,000	\$ 3,630,000	\$ 30,000.00	\$ 3,630,000
4.8	Remove Existing OPGW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.9	Remove Existing OHSW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.10									
4.11									
4.12									
4.13	Rider Poles (187 Locations)	93	Set	\$ 1,750	\$ 162,750	\$ 3,500	\$ 325,500	\$ 5,250.00	\$ 488,250
4.14	Rider Poles - Relocated	94	Set	\$ -	\$ -	\$ 3,500	\$ 329,000	\$ 3,500.00	\$ 329,000
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 4,932,087		\$ 20,895,790		\$ 25,827,877
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,276	Assembly	\$ 1,800	\$ 2,296,800	\$ 720	\$ 918,720	\$ 2,520	\$ 3,215,520
5.2	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.3			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.4	OPGW Assembly - Tangent	304	Assembly	\$ 200	\$ 60,800	\$ 150	\$ 45,600	\$ 350	\$ 106,400
5.5	OPGW Assembly - Angle / DE	64	Assembly	\$ 250	\$ 16,000	\$ 150	\$ 9,600	\$ 400	\$ 25,600
5.6	OHSW Assembly - Tangent	274	Assembly	\$ 200	\$ 54,800	\$ 150	\$ 41,100	\$ 350	\$ 95,900
5.7	OHSW Assembly - Angle / DE	56	Assembly	\$ 250	\$ 14,000	\$ 150	\$ 8,400	\$ 400	\$ 22,400
5.8	OPGW Splice Boxes	27	Assembly	\$ 1,746	\$ 47,146	\$ 2,274	\$ 61,398	\$ 4,020	\$ 108,544
5.9	OPGW Splice & Test	27	EA	\$ 2,520	\$ 68,040	\$ 2,520	\$ 68,040	\$ 5,040	\$ 136,080
5.10	Spacer - Conductor	5,244	EA	\$ 50	\$ 262,200	\$ 35	\$ 183,540	\$ 85	\$ 445,740
5.11	Vibration Dampers - Conductor	4,164	EA	\$ 35	\$ 145,740	\$ 35	\$ 145,740	\$ 70	\$ 291,480
5.12	Shield wire / OPGW Dampers, Misc. Fittings	1,087	EA	\$ 27	\$ 29,349	\$ 35	\$ 38,045	\$ 62	\$ 67,394
5.13	Replace - Mono Pole Vertical Tangent (1-Group of 18-Bells Each Assembly)	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.14	Replace - Dead-end & Angle Insulators (1, Group of 18-Bells Each Assembly)	195	Assembly	\$ 1,800	\$ 351,000	\$ 720	\$ 140,400	\$ 2,520	\$ 491,400
5.15	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.16	Misc. materials (Signs and Markers)	66.8	Mile	\$ 770	\$ 51,436	\$ 1,006	\$ 67,201	\$ 1,776	\$ 118,637
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 5,125,311		\$ 2,418,984		\$ 7,544,295
<b>A. Transmission Line Edic to Princetown</b>					\$ 28,036,826		\$ 94,909,827		\$ 122,946,653
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 4,441,442	\$ 4,441,442	\$ 4,441,442	\$ 4,441,442
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 6,147,333	\$ 6,147,333	\$ 6,147,333	\$ 6,147,333
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 368,840	\$ 368,840	\$ 368,840	\$ 368,840
6.7	Geotech	67	Location	\$ -	\$ -	\$ 3,500	\$ 234,500	\$ 3,500	\$ 234,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 860,627	\$ 860,627	\$ 860,627	\$ 860,627
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 368,840	\$ 368,840	\$ 368,840	\$ 368,840
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 8,640,000	\$ 8,640,000	\$ 8,640,000	\$ 8,640,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
6.17	Compensation for use of 1 Ckt - NYPA Structures (92 Structures)	1	LS	\$ -	\$ -	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123
6.18	Sales Tax on Materials	1	LS	\$ 2,242,946	\$ 2,242,946	\$ -	\$ -	\$ 2,242,946	\$ 2,242,946
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 122,947	\$ 122,947	\$ 122,947	\$ 122,947
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,242,946		\$ 33,832,050		\$ 36,074,996

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**A1. Marcy Interconnect & New Scotland SS Loop**

Estimate Revision: **7** Total: \$ **34,180,965**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>A1. Marcy Interconnect &amp; New Scotland SS Loop</b>			
1. CLEARING & ACCESS	\$ -	\$ 4,749,184	\$ 4,749,184
2. FOUNDATIONS	\$ 5,113,108	\$ 6,968,775	\$ 12,081,883
3. STRUCTURES	\$ 3,973,368	\$ 3,182,477	\$ 7,155,845
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 682,610	\$ 1,278,833	\$ 1,961,442
5. INSULATORS, FITTINGS, HARDWARE	\$ 706,655	\$ 454,742	\$ 1,161,397
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 838,059	\$ 6,233,155	\$ 7,071,214
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 11,313,799</b>	<b>\$ 22,867,166</b>	<b>\$ 34,180,965</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 11,313,799</b>	<b>\$ 22,867,166</b>	<b>\$ 34,180,965</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A1. Marcy Interconnect &amp; New Scotland SS Loop</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	98.0	Acre	\$ -	\$ -	\$ 15,000	\$ 1,470,000	\$ 15,000	\$ 1,470,000
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Permanent Access Road	2,851.2	LF	\$ -	\$ -	\$ 45	\$ 128,304	\$ 45	\$ 128,304
1.4	Silt Fence	14,256.0	LF	\$ -	\$ -	\$ 4	\$ 57,024	\$ 4	\$ 57,024
1.5	Matting - Access and ROW	11,404.8	LF	\$ -	\$ -	\$ 70	\$ 798,336	\$ 70	\$ 798,336
1.6	Matting - To Work Area	25,200.0	LF	\$ -	\$ -	\$ 70	\$ 1,764,000	\$ 70	\$ 1,764,000
1.7	Snow Removal	2.7	Mile	\$ -	\$ -	\$ 16,000	\$ 43,200	\$ 16,000	\$ 43,200
1.8	ROW Restoration	2.7	Mile	\$ -	\$ -	\$ 10,000	\$ 26,600	\$ 10,000	\$ 26,600
1.9	Work Pads	120,000.0	SF	\$ -	\$ -	\$ 4	\$ 422,400	\$ 4	\$ 422,400
1.10	Restoration for Work Pad areas	24,000.0	SF	\$ -	\$ -	\$ 0.15	\$ 3,600	\$ 0.15	\$ 3,600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	4.0	EA	\$ -	\$ -	\$ 4,580	\$ 18,320	\$ 4,580	\$ 18,320
1.14	Maintenance and Protection of Traffic on Public Roads	-	LS	\$ -	\$ -	\$ 300,000	\$ -	\$ 300,000	\$ -
1.15	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.16	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.17	Concrete Washout Station	4.0	EA	\$ -	\$ -	\$ 1,850	\$ 7,400	\$ 1,850	\$ 7,400
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ -		\$ 4,749,184		\$ 4,749,184
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 765KV 3-POLE LARGE ANGLE DEADEND (INNER POLE)	2	EA	\$ 130,812	\$ 261,624	\$ 132,236	\$ 264,472	\$ 263,048	\$ 526,096
2.2	1-CKT 765KV 3-POLE LARGE ANGLE DEADEND (OUTER POLE)	4	EA	\$ 130,812	\$ 523,248	\$ 132,236	\$ 528,944	\$ 263,048	\$ 1,052,192
2.3	1-CKT 765KV 3-POLE MEDIUM ANGLE DEADEND (INNER POLE)	2	EA	\$ 130,812	\$ 261,624	\$ 132,236	\$ 264,472	\$ 263,048	\$ 526,096
2.4	1-CKT 765KV 3-POLE MEDIUM ANGLE DEADEND (OUTER POLE)	4	EA	\$ 130,812	\$ 523,248	\$ 132,236	\$ 528,944	\$ 263,048	\$ 1,052,192
2.5	1-CKT 765KV H-FRAME TANGENT	12	EA	\$ 130,812	\$ 1,569,743	\$ 132,236	\$ 1,586,833	\$ 263,048	\$ 3,156,576
2.6	1-CKT 765KV 3-POLE LARGE ANGLE DEADEND (INNER POLE)	1	EA	\$ 140,973	\$ 140,973	\$ 142,508	\$ 142,508	\$ 283,481	\$ 283,481
2.7	1-CKT 765KV 3-POLE LARGE ANGLE DEADEND (OUTER POLE)	2	EA	\$ 140,973	\$ 281,946	\$ 142,508	\$ 285,016	\$ 283,481	\$ 566,961
2.8	1-CKT 765KV 3-POLE MEDIUM ANGLE DEADEND (INNER POLE)	1	EA	\$ 140,973	\$ 140,973	\$ 142,508	\$ 142,508	\$ 283,481	\$ 283,481
2.9	1-CKT 765KV 3-POLE MEDIUM ANGLE DEADEND (OUTER POLE)	2	EA	\$ 140,973	\$ 281,946	\$ 142,508	\$ 285,016	\$ 283,481	\$ 566,961
2.10	1-CKT 765KV H-FRAME TANGENT	8	EA	\$ 140,973	\$ 1,127,784	\$ 142,508	\$ 1,140,062	\$ 283,481	\$ 2,267,846
2.11	Rock Excavation	900	CY	\$ -	\$ -	\$ 2,000	\$ 1,800,000	\$ 2,000	\$ 1,800,000
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 5,113,108		\$ 6,968,775		\$ 12,081,883
<b>3. STRUCTURES</b>									
3.1	1-CKT 765KV 3-POLE LARGE ANGLE DEADEND	2	Structure	\$ 255,540.50	\$ 511,081	\$ 153,324.30	\$ 306,649	\$ 408,865	\$ 817,730

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
3.2	1-CKT 765KV 3-POLE MEDIUM ANGLE DEADEND	2	Structure	\$ 255,540.50	\$ 511,081	\$ 153,324.30	\$ 306,649	\$ 408,865	\$ 817,730
3.3	1-CKT 765KV H-FRAME TANGENT	6	Structure	\$ 255,540.50	\$ 1,533,243	\$ 153,324.30	\$ 919,946	\$ 408,865	\$ 2,453,189
3.4	1-CKT 765KV 3-POLE LARGE ANGLE DEADEND	1	Structure	\$ 233,291.17	\$ 233,291	\$ 139,974.70	\$ 139,975	\$ 373,266	\$ 373,266
3.5	1-CKT 765KV 3-POLE MEDIUM ANGLE DEADEND	1	Structure	\$ 233,291.17	\$ 233,291	\$ 139,974.70	\$ 139,975	\$ 373,266	\$ 373,266
3.6	1-CKT 765KV H-FRAME TANGENT	4	Structure	\$ 233,291.17	\$ 933,165	\$ 139,974.70	\$ 559,899	\$ 373,266	\$ 1,493,063
3.7	Remove Existing Structure and Accessories - Lattice	3	EA	\$ -	\$ -	\$ 12,500	\$ 37,500	\$ 12,500	\$ 37,500
3.8	Remove Existing Structure and Accessories - 3-Pole	3	EA	\$ -	\$ -	\$ 37,500	\$ 112,500	\$ 37,500	\$ 112,500
3.9	Remove Existing Structure and Accessories - H-Frame	11	EA	\$ -	\$ -	\$ 12,500	\$ 137,500	\$ 12,500	\$ 137,500
3.10	Remove Existing Foundation	43	EA	\$ -	\$ -	\$ 7,500	\$ 322,500	\$ 7,500	\$ 322,500
3.11	Install Grounding and Grounding Accessories	36	Pole	\$ 506	\$ 18,216	\$ 5,539	\$ 199,386	\$ 6,045	\$ 217,602
3.12									
3.13									
3.14									
3.15									
3.16									
3.17									
<b>TOTAL - STRUCTURES:</b>					\$ 3,973,368		\$ 3,182,477		\$ 7,155,845
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	765kV - (1) 1351.5kcmil 54/19 ACSR "Martin"	176,964	LF	\$ 3.59	\$ 634,770	\$ 5.00	\$ 884,820	\$ 8.59	\$ 1,519,590
4.2	(1) OPGW 36 Fiber AC-33/38/571	14,747	LF	\$ 1.35	\$ 19,909	\$ 5.00	\$ 73,736	\$ 6.35	\$ 93,645
4.3	(1) 3/8" EHS7 Steel	14,747	LF	\$ 0.47	\$ 6,931	\$ 5.00	\$ 73,736	\$ 5.47	\$ 80,667
4.4	Remove Existing Conductor and Accessories	2.66	Mile	\$ -	\$ -	\$ 45,000	\$ 119,700	\$ 45,000.00	\$ 119,700
4.5	Remove Existing OPGW and Accessories	2.66	Mile	\$ -	\$ -	\$ 12,000	\$ 31,920	\$ 12,000.00	\$ 31,920
4.6	Remove Existing OHSW and Accessories	2.66	Mile	\$ -	\$ -	\$ 12,000	\$ 31,920	\$ 12,000.00	\$ 31,920
4.7	Rider Poles	12	Set	\$ 1,750	\$ 21,000	\$ 3,500	\$ 42,000	\$ 5,250.00	\$ 63,000
4.8	Rider Poles - Relocated	6	Set	\$ -	\$ -	\$ 3,500	\$ 21,000	\$ 3,500.00	\$ 21,000
4.9									
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 682,610		\$ 1,278,833		\$ 1,961,442
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	765kV Tangent (1-Group of 40-Bells Each Assembly)	60	Assembly	\$ 4,000	\$ 240,000	\$ 1,440	\$ 86,400	\$ 5,440	\$ 326,400
5.2	765kV Dead-end & Angle Insulators (1-Group of 40-Bells Each Assembly)	90	Assembly	\$ 4,000	\$ 360,000	\$ 1,440	\$ 129,600	\$ 5,440	\$ 489,600
5.3									\$ -
5.4	OPGW Assembly - Tangent	10	Assembly	\$ 200	\$ 2,000	\$ 150	\$ 1,500	\$ 350	\$ 3,500
5.5	OPGW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.6	OHSW Assembly - Tangent	10	Assembly	\$ 200	\$ 2,000	\$ 150	\$ 1,500	\$ 350	\$ 3,500
5.7	OHSW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.8	OPGW Splice Boxes	4	Assembly	\$ 1,746	\$ 6,985	\$ 2,274	\$ 9,096	\$ 4,020	\$ 16,081
5.9	OPGW Splice & Test	4	EA	\$ 2,520	\$ 10,080	\$ 2,520	\$ 10,080	\$ 5,040	\$ 20,160
5.10	Spacer - Conductor	531	EA	\$ 50	\$ 26,550	\$ 35	\$ 18,585	\$ 85	\$ 45,135
5.11	Vibration Dampers - Conductor	531	EA	\$ 35	\$ 18,585	\$ 35	\$ 18,585	\$ 70	\$ 37,170
5.12	Shield wire / OPGW Dampers, Misc. Fittings	88	EA	\$ 27	\$ 2,376	\$ 35	\$ 3,080	\$ 62	\$ 5,456
5.13	Splicing at existing 765kV DE	4	LS	\$ 7,500	\$ 30,000	\$ 42,500	\$ 170,000	\$ 50,000	\$ 200,000
5.14	Guys, Anchors, and Accessories	-	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.15	Misc. materials (Signs and Markers)	2.7	Mile	\$ 770	\$ 2,079	\$ 1,006	\$ 2,716	\$ 1,776	\$ 4,795
5.16									
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 706,655		\$ 454,742		\$ 1,161,397
<b>A1. Marcy Interconnect &amp; New Scotland SS Loop</b>					\$ 10,475,740		\$ 16,634,011		\$ 27,109,751
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 271,098	\$ 271,098	\$ 271,098	\$ 271,098

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 979,338	\$ 979,338	\$ 979,338	\$ 979,338
6.3	Utility PM and Project Oversite	1	LS		\$ -	\$ 271,098	\$ 271,098	\$ 271,098	\$ 271,098
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 271,098	\$ 271,098	\$ 271,098	\$ 271,098
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,355,488	\$ 1,355,488	\$ 1,355,488	\$ 1,355,488
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 81,329	\$ 81,329	\$ 81,329	\$ 81,329
6.7	Geotech	3	Location	\$ -	\$ -	\$ 3,500	\$ 10,500	\$ 3,500	\$ 10,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 189,768	\$ 189,768	\$ 189,768	\$ 189,768
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 81,329	\$ 81,329	\$ 81,329	\$ 81,329
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 2,187,000	\$ 2,187,000	\$ 2,187,000	\$ 2,187,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 468,000	\$ 468,000	\$ 468,000	\$ 468,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 838,059	\$ 838,059	\$ -	\$ -	\$ 838,059	\$ 838,059
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 27,110	\$ 27,110	\$ 27,110	\$ 27,110
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 838,059		\$ 6,233,155		\$ 7,071,214

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**B. Transmission Line Princetown to Rotterdam**

Estimate  
Revision: 7

Total: \$ 24,720,461

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>B. Transmission Line Princetown to Rotterdam</b>			
1. CLEARING & ACCESS	\$ 6,000	\$ 3,038,200	\$ 3,044,200
2. FOUNDATIONS	\$ 417,002	\$ 3,778,708	\$ 4,195,711
3. STRUCTURES	\$ 3,876,135	\$ 4,280,943	\$ 8,157,078
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 722,365	\$ 2,620,705	\$ 3,343,070
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,199,031	\$ 549,192	\$ 1,748,223
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 497,643	\$ 3,734,537	\$ 4,232,179
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 6,718,177	\$ 18,002,285	\$ 24,720,461
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 6,718,177	\$ 18,002,285	\$ 24,720,461

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Princetown to Rotterdam</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	24.0	Acre	\$ -	\$ -	\$ 5,000	\$ 120,000	\$ 5,000	\$ 120,000
1.3	Permanent Access Road	5,280	LF	\$ -	\$ -	\$ 45	\$ 237,600	\$ 45	\$ 237,600
1.4	Silt Fence	26,400	LF	\$ -	\$ -	\$ 4	\$ 105,600	\$ 4	\$ 105,600
1.5	Matting - Access and ROW	21,120	LF	\$ -	\$ -	\$ 70	\$ 1,478,400	\$ 70	\$ 1,478,400
1.6	Matting - To Work Area	2,775	LF	\$ -	\$ -	\$ 70	\$ 194,250	\$ 70	\$ 194,250
1.7	Snow Removal	5	Mile	\$ -	\$ -	\$ 16,000	\$ 80,000	\$ 16,000	\$ 80,000
1.8	ROW Restoration	5	Mile	\$ -	\$ -	\$ 10,000	\$ 50,000	\$ 10,000	\$ 50,000
1.9	Work Pads	185,000	SF	\$ -	\$ -	\$ 4	\$ 651,200	\$ 4	\$ 651,200
1.10	Restoration for Work Pad areas	37,000	SF	\$ -	\$ -	\$ 0.2	\$ 5,550	\$ 0	\$ 5,550
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	10	EA	\$ -	\$ -	\$ 4,580	\$ 45,800	\$ 4,580	\$ 45,800
1.14	Maintenance and Protection of Traffic on Public Roads	10	EA	\$ -	\$ -	\$ 4,130	\$ 41,300	\$ 4,130	\$ 41,300
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 6,000		\$ 3,038,200		\$ 3,044,200
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 6' x 18'	56	EA	\$ 1,857	\$ 104,018	\$ 18,603	\$ 1,041,794	\$ 20,461	\$ 1,145,812
2.2	Direct Embed Foundations - 6' x 20'	4	EA	\$ 2,046	\$ 8,185	\$ 20,562	\$ 82,247	\$ 22,608	\$ 90,432
2.3	Direct Embed Foundations - 6' x 22'	8	EA	\$ 2,235	\$ 17,880	\$ 22,520	\$ 180,160	\$ 24,755	\$ 198,040
2.4	Direct Embed Foundations - 7' x 25'	4	EA	\$ 3,105	\$ 12,422	\$ 34,650	\$ 138,601	\$ 37,756	\$ 151,023
2.5	Drilled Pier - 6' x 19'	6	EA	\$ 17,204	\$ 103,223	\$ 17,391	\$ 104,347	\$ 34,595	\$ 207,570
2.6	Drilled Pier - 8' x 27'	4	EA	\$ 42,819	\$ 171,274	\$ 57,340	\$ 229,359	\$ 100,158	\$ 400,633
2.7	Rock Excavation Adder	1,001.1	CY	\$ -	\$ -	\$ 2,000	\$ 2,002,200	\$ 2,000	\$ 2,002,200
<b>TOTAL - FOUNDATIONS:</b>					\$ 417,002		\$ 3,778,708		\$ 4,195,711
<b>3. STRUCTURES</b>									
3.1	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 115'	24	Structure	\$ 85,544	\$ 2,053,056	\$ 51,326	\$ 1,231,834	\$ 136,870	\$ 3,284,890
3.2	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 135'	2	Structure	\$ 106,005	\$ 212,010	\$ 63,603	\$ 127,206	\$ 169,608	\$ 339,216
3.3	2x 1-CKT 345KV DELTA SMALL ANGLE (1°-15°) - 115'	2	Structure	\$ 141,673	\$ 283,346	\$ 85,004	\$ 170,008	\$ 226,677	\$ 453,354
3.4	2x 1-CKT 345KV VERTICAL TANGENT DEADEND (0°-5°) - 115'	4	Structure	\$ 109,816	\$ 439,264	\$ 65,890	\$ 263,558	\$ 175,706	\$ 702,822
3.5	2x 1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	2	Structure	\$ 232,656	\$ 465,312	\$ 139,594	\$ 279,187	\$ 372,250	\$ 744,499
3.6	2x 1-CKT 345KV 3-POLE LARGE ANGLE DEADEND (60°-90°) - 115'	1	Structure	\$ 176,342	\$ 176,342	\$ 105,805	\$ 105,805	\$ 282,147	\$ 282,147
3.7	2x 1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 65'	1	Structure	\$ 99,493	\$ 99,493	\$ 59,696	\$ 59,696	\$ 159,189	\$ 159,189

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.8	2x 1-CKT 345KV DELTA TANGENT (0°-1°) HD- 115'	1	Structure	\$ 105,820	\$ 105,820	\$ 63,492	\$ 63,492	\$ 169,312	\$ 169,312
3.9	Remove Existing Foundation	22	EA	\$ -	\$ -	\$ 7,500	\$ 163,500	\$ 7,500	\$ 163,500
3.10	Remove Existing Structure and Accessories	109	EA	\$ -	\$ -	\$ 12,500	\$ 1,362,500	\$ 12,500	\$ 1,362,500
3.11	Install Grounding and Grounding Accessories	82	Pole	\$ 506	\$ 41,492	\$ 5,539	\$ 454,157	\$ 6,045	\$ 495,649
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 3,876,135		\$ 4,280,943		\$ 8,157,078
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal" (R1 - R36)	339,293	LF	\$ 1.90	\$ 644,657	\$ 5.00	\$ 1,696,465	\$ 6.90	\$ 2,341,122
4.2	(1) OPGW 36 Fiber AC-33/38/571 (R1 - R36)	28,274	LF	\$ 1.35	\$ 38,170	\$ 5.00	\$ 141,370	\$ 6.35	\$ 179,540
4.3	(1) 3/8" EHS7 Steel (R1 - R36)	28,274	LF	\$ 0.47	\$ 13,289	\$ 5.00	\$ 141,370	\$ 5.47	\$ 154,659
4.5	Remove Existing Conductor and Accessories	10.0	Mile	\$ -	\$ -	\$ 30,000	\$ 300,000	\$ 30,000.00	\$ 300,000
4.6	Remove Existing OPGW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.7	Remove Existing OHSW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.8	Rider Poles	15	EA	\$ 1,750	\$ 26,250	\$ 3,500	\$ 52,500	\$ 5,250.00	\$ 78,750
4.9	Rider Poles - Relocated	14	Set	\$ -	\$ -	\$ 3,500	\$ 49,000	\$ 3,500.00	\$ 49,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 722,365		\$ 2,620,705		\$ 3,343,070
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	348	Assembly	\$ 1,800	\$ 626,400	\$ 720	\$ 250,560	\$ 2,520	\$ 876,960
5.2	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	240	Assembly	\$ 1,800	\$ 432,000	\$ 720	\$ 172,800	\$ 2,520	\$ 604,800
5.3	OPGW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.4	OPGW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.5	OHSW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.6	OHSW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.7	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.8	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.9	Spacer - Conductor	1,002	EA	\$ 50	\$ 50,100	\$ 35	\$ 35,070	\$ 85	\$ 85,170
5.10	Vibration Dampers - Conductor	852	EA	\$ 35	\$ 29,820	\$ 35	\$ 29,820	\$ 70	\$ 59,640
5.11	Shieldwire / OPGW Dampers, Misc. Fittings	116	EA	\$ 27	\$ 3,132	\$ 35	\$ 4,060	\$ 62	\$ 7,192
5.12	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.13	Misc. materials (Signs and Markers)	5.0	Mile	\$ 770	\$ 3,850	\$ 1,006	\$ 5,030	\$ 1,776	\$ 8,880
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,199,031		\$ 549,192		\$ 1,748,223
<b>B. Transmission Line Princetown to Rotterdam</b>					\$ 6,220,534		\$ 14,267,748		\$ 20,488,282
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 740,138	\$ 740,138	\$ 740,138	\$ 740,138
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.7	Geotech	5	Location	\$ -	\$ -	\$ 3,500	\$ 17,500	\$ 3,500	\$ 17,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 143,418	\$ 143,418	\$ 143,418	\$ 143,418
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 497,643	\$ 497,643	\$ -	\$ -	\$ 497,643	\$ 497,643

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 20,488	\$ 20,488	\$ 20,488	\$ 20,488
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 497,643		\$ 3,734,537		\$ 4,232,179

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**C. Transmission Line Princetown to New Scotland**

Estimate  
Revision: 7

Total: \$ 47,048,794

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>C. Transmission Line Princetown to New Scotland</b>			
1. CLEARING & ACCESS	\$ 31,000	\$ 11,223,694	\$ 11,254,694
2. FOUNDATIONS	\$ 1,194,705	\$ 4,499,949	\$ 5,694,653
3. STRUCTURES	\$ 6,879,617	\$ 5,578,039	\$ 12,457,656
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 1,564,842	\$ 4,756,290	\$ 6,321,132
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,767,073	\$ 847,291	\$ 2,614,365
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 914,979	\$ 7,791,316	\$ 8,706,295
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 12,352,215</b>	<b>\$ 34,696,579</b>	<b>\$ 47,048,794</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 12,352,215</b>	<b>\$ 34,696,579</b>	<b>\$ 47,048,794</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	26.0	Acre	\$ -	\$ -	\$ 15,000	\$ 390,000	\$ 15,000	\$ 390,000
1.2	Clearing the ROW - Light (mowing)	57.0	Acre	\$ -	\$ -	\$ 5,000	\$ 285,000	\$ 5,000	\$ 285,000
1.3	Permanent Access Road	20,803.2	LF	\$ -	\$ -	\$ 45	\$ 936,144	\$ 45	\$ 936,144
1.4	Silt Fence	104,016.0	LF	\$ -	\$ -	\$ 4	\$ 416,064	\$ 4	\$ 416,064
1.5	Matting - Access and ROW	83,212.8	LF	\$ -	\$ -	\$ 70	\$ 5,824,896	\$ 70	\$ 5,824,896
1.6	Matting - To Work Area	3,375.0	LF	\$ -	\$ -	\$ 70	\$ 236,250	\$ 70	\$ 236,250
1.7	Snow Removal	19.7	Mile	\$ -	\$ -	\$ 16,000	\$ 315,200	\$ 16,000	\$ 315,200
1.8	ROW Restoration	19.7	Mile	\$ -	\$ -	\$ 10,000	\$ 197,000	\$ 10,000	\$ 197,000
1.9	Work Pads	645,000.0	SF	\$ -	\$ -	\$ 4	\$ 2,270,400	\$ 4	\$ 2,270,400
1.10	Restoration for Work Pad areas	129,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 19,350	\$ 0	\$ 19,350
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	2	EA	\$ -	\$ -	\$ 14,445	\$ 28,890	\$ 14,445	\$ 28,890
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	50	EA	\$ -	\$ -	\$ 4,130	\$ 206,500	\$ 4,130	\$ 206,500
1.15	Gates	11	EA	\$ 2,000	\$ 22,000	\$ 2,500	\$ 27,500	\$ 4,500	\$ 49,500
1.16	Culverts / Misc. Access	12	EA	\$ 750	\$ 9,000	\$ 1,250	\$ 15,000	\$ 2,000	\$ 24,000
1.17	Concrete Washout Station	30	EA	\$ -	\$ -	\$ 1,850	\$ 55,500	\$ 1,850	\$ 55,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 31,000		\$ 11,223,694		\$ 11,254,694
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 4' x 16'	100	EA	\$ 941	\$ 94,073	\$ 7,398	\$ 739,787	\$ 8,339	\$ 833,860
2.2	Direct Embed Foundations - 4' x 19'	14	EA	\$ 1,104	\$ 15,455	\$ 8,703	\$ 121,847	\$ 9,807	\$ 137,302
2.3	Direct Embed Foundations - 4' x 21'	2	EA	\$ 1,213	\$ 2,425	\$ 9,574	\$ 19,147	\$ 10,786	\$ 21,573
2.4	Direct Embed Foundations - 6' x 18'	9	EA	\$ 1,857	\$ 16,717	\$ 18,603	\$ 167,431	\$ 20,461	\$ 184,148
2.5	Direct Embed Foundations - 6' x 20'	14	EA	\$ 2,046	\$ 28,648	\$ 20,562	\$ 287,864	\$ 22,608	\$ 316,512
2.6	Direct Embed Foundations - 6' x 21'	25	EA	\$ 2,141	\$ 53,516	\$ 21,541	\$ 538,521	\$ 23,681	\$ 592,037
2.7	Direct Embed Foundations - 6' x 22'	4	EA	\$ 2,235	\$ 8,940	\$ 22,520	\$ 90,080	\$ 24,755	\$ 99,020
2.8	Direct Embed Foundations - 6' x 25'	5	EA	\$ 2,518	\$ 12,591	\$ 25,457	\$ 127,287	\$ 27,976	\$ 139,878
2.9	Direct Embed Foundations - 6' x 29'	1	EA	\$ 2,896	\$ 2,896	\$ 29,374	\$ 29,374	\$ 32,270	\$ 32,270
2.10	Direct Embed Foundations - 6' x 34'	4	EA	\$ 3,273	\$ 13,093	\$ 33,290	\$ 133,162	\$ 36,564	\$ 146,255
2.11	Direct Embed Foundations - 6' x 42'	3	EA	\$ 4,123	\$ 12,369	\$ 42,103	\$ 126,308	\$ 46,225	\$ 138,676
2.12	Direct Embed Foundations - 7' x 25'	1	EA	\$ 3,105	\$ 3,105	\$ 34,650	\$ 34,650	\$ 37,756	\$ 37,756
2.13	Direct Embed Foundations - 7' x 27'	1	EA	\$ 3,337	\$ 3,337	\$ 37,316	\$ 37,316	\$ 40,652	\$ 40,652
2.14	Direct Embed Foundations - 7' x 28'	1	EA	\$ 3,452	\$ 3,452	\$ 38,648	\$ 38,648	\$ 42,101	\$ 42,101
2.15	Drilled Pier - 6' x 20'	6	EA	\$ 18,064	\$ 108,384	\$ 18,261	\$ 109,564	\$ 36,325	\$ 217,949
2.16	Drilled Pier - 7' x 19'	15	EA	\$ 23,416	\$ 351,246	\$ 23,671	\$ 355,070	\$ 47,088	\$ 706,315
2.17	Drilled Pier - 7' x 24'	3	EA	\$ 29,270	\$ 87,811	\$ 29,589	\$ 88,767	\$ 58,860	\$ 176,579
2.18	Drilled Pier - 8' x 27'	1	EA	\$ 42,819	\$ 42,819	\$ 43,285	\$ 43,285	\$ 86,103	\$ 86,103
2.19	Drilled Pier - 8' x 83'	1	EA	\$ 128,456	\$ 128,456	\$ 172,020	\$ 172,020	\$ 300,475	\$ 300,475

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.20	Drilled Pier - 8' x 89'	1	EA	\$ 137,631	\$ 137,631	\$ 184,307	\$ 184,307	\$ 321,938	\$ 321,938
2.21	Drilled Pier - 9' x 34'	1	EA	\$ 67,740	\$ 67,740	\$ 90,713	\$ 90,713	\$ 158,454	\$ 158,454
2.22		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.23	Rock Excavation Adder (20% of Excavation)	482.40	CY	\$ -	\$ -	\$ 2,000	\$ 964,800	\$ 2,000	\$ 964,800
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,194,705		\$ 4,499,949		\$ 5,694,653
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 50,024	\$ 350,168	\$ 30,014	\$ 210,101	\$ 80,038	\$ 560,269
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 120'	5	Structure	\$ 52,207	\$ 261,035	\$ 31,324	\$ 156,621	\$ 83,531	\$ 417,656
3.3	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 125'	8	Structure	\$ 55,685	\$ 445,480	\$ 33,411	\$ 267,288	\$ 89,096	\$ 712,768
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 130'	9	Structure	\$ 58,257	\$ 524,309	\$ 34,954	\$ 314,585	\$ 93,210	\$ 838,894
3.5	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 135'	4	Structure	\$ 60,884	\$ 243,534	\$ 36,530	\$ 146,120	\$ 97,414	\$ 389,654
3.6	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 145'	1	Structure	\$ 64,473	\$ 64,473	\$ 38,684	\$ 38,684	\$ 103,156	\$ 103,156
3.7	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 115'	1	Structure	\$ 72,039	\$ 72,039	\$ 43,223	\$ 43,223	\$ 115,262	\$ 115,262
3.8	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 135'	1	Structure	\$ 92,278	\$ 92,278	\$ 55,367	\$ 55,367	\$ 147,645	\$ 147,645
3.9	1-CKT 345KV VERTICAL TANGENT DEADEND (0°-5°) - 120'	1	Structure	\$ 58,164	\$ 58,164	\$ 34,898	\$ 34,898	\$ 93,062	\$ 93,062
3.10	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 105'	1	Structure	\$ 98,883	\$ 98,883	\$ 59,330	\$ 59,330	\$ 158,212	\$ 158,212
3.11	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 84'	43	Structure	\$ 29,526	\$ 1,269,618	\$ 17,716	\$ 761,771	\$ 47,242	\$ 2,031,389
3.12	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 89'	5	Structure	\$ 32,708	\$ 163,540	\$ 19,625	\$ 98,124	\$ 52,333	\$ 261,664
3.13	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 93'	5	Structure	\$ 34,540	\$ 172,698	\$ 20,724	\$ 103,619	\$ 55,263	\$ 276,316
3.14	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 107'	5	Structure	\$ 45,936	\$ 229,678	\$ 27,561	\$ 137,807	\$ 73,497	\$ 367,484
3.15	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 80'	3	Structure	\$ 55,241	\$ 165,723	\$ 33,145	\$ 99,434	\$ 88,386	\$ 265,157
3.16	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 80'	5	Structure	\$ 69,079	\$ 345,395	\$ 41,447	\$ 207,237	\$ 110,526	\$ 552,632
3.17	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 85'	1	Structure	\$ 75,739	\$ 75,739	\$ 45,443	\$ 45,443	\$ 121,182	\$ 121,182
3.18	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 80'	5	Structure	\$ 97,403	\$ 487,013	\$ 58,442	\$ 292,208	\$ 155,844	\$ 779,220
3.19	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 95'	1	Structure	\$ 129,408	\$ 129,408	\$ 77,645	\$ 77,645	\$ 207,052	\$ 207,052
3.20	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 178,026	\$ 178,026	\$ 106,815	\$ 106,815	\$ 284,841	\$ 284,841
3.21	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 54,631	\$ 382,414	\$ 32,778	\$ 229,448	\$ 87,409	\$ 611,862
3.22	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 125'	4	Structure	\$ 62,604	\$ 250,416	\$ 37,562	\$ 150,250	\$ 100,166	\$ 400,666
3.23	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 135'	1	Structure	\$ 68,894	\$ 68,894	\$ 41,336	\$ 41,336	\$ 110,230	\$ 110,230
3.24	2-CKT 115KV/345KV VERTICAL SMALL ANGLE (1°-15°) - 155'	1	Structure	\$ 149,480	\$ 149,480	\$ 89,688	\$ 89,688	\$ 239,168	\$ 239,168
3.25	2-CKT 115KV/345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 173,808	\$ 173,808	\$ 104,285	\$ 104,285	\$ 278,092	\$ 278,092
3.26	2-CKT 115KV/345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 125'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.27	115KV DUMMY DE, Drilled Pier, 85'	2	Structure	\$ 58,164	\$ 116,328	\$ 34,898	\$ 69,797	\$ 93,062	\$ 186,125
3.28	Remove Existing Foundation	4	EA	\$ -	\$ -	\$ 7,500	\$ 30,000	\$ 7,500	\$ 30,000
3.29	Remove Existing Structure and Accessories	24	EA	\$ -	\$ -	\$ 12,500	\$ 300,000	\$ 12,500	\$ 300,000
3.30	Install Grounding and Grounding Accessories	214	Pole	\$ 506	\$ 108,284	\$ 5,539	\$ 1,185,239	\$ 6,045	\$ 1,293,523
<b>TOTAL - STRUCTURES:</b>					\$ 6,879,617		\$ 5,578,039		\$ 12,457,656
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal" (ENS-336 to ENS-464)	661,954	LF	\$ 1.90	\$ 1,257,713	\$ 5.00	\$ 3,309,770	\$ 6.90	\$ 4,567,483
4.2	(1) OPGW 36 Fiber AC-33/38/571 (ENS-336 to ENS-464)	110,326	LF	\$ 1.35	\$ 148,940	\$ 5.00	\$ 551,630	\$ 6.35	\$ 700,570
4.3	(1) 3/8" EHS7 Steel (ENS-336 to ENS-464)	75,398	LF	\$ 0.47	\$ 35,437	\$ 5.00	\$ 376,990	\$ 5.47	\$ 412,427
4.4		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.5	115KV - (1) 954kcmil 54/7 ACSS "Cardinal" (ENS-336 to ENS-464)	41,580	LF	\$ 1.90	\$ 79,002	\$ 5.00	\$ 207,900	\$ 6.90	\$ 286,902
4.6	(1) OPGW 36 Fiber AC-33/38/571 (ENS-336 to ENS-464)	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.7	(1) 3/8" EHS7 Steel (ENS-336 to ENS-464)	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.8	Remove Existing Conductor and Accessories	2.5	Mile	\$ -	\$ -	\$ 30,000	\$ 75,000	\$ 30,000.00	\$ 75,000
4.9	Remove Existing OPGW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.10	Remove Existing OHSW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.11	Rider Poles (50 Locations)	25	Set	\$ 1,750	\$ 43,750	\$ 3,500	\$ 87,500	\$ 5,250.00	\$ 131,250
4.12	Rider Poles - Relocated	25	Set	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500.00	\$ 87,500
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 1,564,842		\$ 4,756,290		\$ 6,321,132
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345KV Tangent (1-Group of 18-Bells Each Assembly)	538	Assembly	\$ 1,800	\$ 968,400	\$ 720	\$ 387,360	\$ 2,520	\$ 1,355,760
5.2	115KV Tangent (1-Group of 9-Bells Each Assembly)	78	Assembly	\$ 900	\$ 70,200	\$ 560	\$ 43,680	\$ 1,460	\$ 113,880
5.3	345KV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	255	Assembly	\$ 1,800	\$ 459,000	\$ 720	\$ 183,600	\$ 2,520	\$ 642,600
5.4	115KV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	21	Assembly	\$ 900	\$ 18,900	\$ 560	\$ 11,760	\$ 1,460	\$ 30,660
5.5									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.6									
5.7	OPGW Assembly - Tangent	110	Assembly	\$ 200	\$ 22,000	\$ 150	\$ 16,500	\$ 350	\$ 38,500
5.8	OPGW Assembly - Angle / DE	34	Assembly	\$ 250	\$ 8,500	\$ 150	\$ 5,100	\$ 400	\$ 13,600
5.9	OHSW Assembly - Tangent	61	Assembly	\$ 200	\$ 12,200	\$ 150	\$ 9,150	\$ 350	\$ 21,350
5.10	OHSW Assembly - Angle / DE	24	Assembly	\$ 250	\$ 6,000	\$ 150	\$ 3,600	\$ 400	\$ 9,600
5.11	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.12	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.13	Spacer - Conductor	1,773	EA	\$ 50	\$ 88,650	\$ 35	\$ 62,055	\$ 85	\$ 150,705
5.14	Vibration Dampers - Conductor	1,596	EA	\$ 35	\$ 55,860	\$ 35	\$ 55,860	\$ 70	\$ 111,720
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	293	EA	\$ 27	\$ 7,911	\$ 35	\$ 10,255	\$ 62	\$ 18,166
5.16	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.17	Misc. materials (Signs and Markers)	19.9	Mile	\$ 770	\$ 15,323	\$ 1,006	\$ 20,019	\$ 1,776	\$ 35,342
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,767,073		\$ 847,291		\$ 2,614,365
<b>C. Transmission Line Princetown to New Scotland</b>					\$ 11,437,237		\$ 26,905,263		\$ 38,342,499
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,385,121	\$ 1,385,121	\$ 1,385,121	\$ 1,385,121
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,917,125	\$ 1,917,125	\$ 1,917,125	\$ 1,917,125
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 115,027	\$ 115,027	\$ 115,027	\$ 115,027
6.7	Geotech	20	Location	\$ -	\$ -	\$ 3,500	\$ 70,000	\$ 3,500	\$ 70,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 268,397	\$ 268,397	\$ 268,397	\$ 268,397
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 115,027	\$ 115,027	\$ 115,027	\$ 115,027
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 215,000	\$ 215,000	\$ 215,000	\$ 215,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,477,000	\$ 2,477,000	\$ 2,477,000	\$ 2,477,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 914,979	\$ 914,979	\$ -	\$ -	\$ 914,979	\$ 914,979
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 38,342	\$ 38,342	\$ 38,342	\$ 38,342
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 914,979		\$ 7,791,316		\$ 8,706,295

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**D. Rotterdam Substation - Install**

Estimate Revision: **7** Total: \$ **54,261,332**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>D. Rotterdam Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,896,891	\$ 8,053,255	\$ 10,950,146
2. SUBSTATION FOUNDATIONS	\$ 2,443,003	\$ 2,616,200	\$ 5,059,203
3. SUBSTATION STRUCTURES	\$ 944,980	\$ 944,980	\$ 1,889,960
4. MAJOR EQUIPMENT	\$ 11,915,000	\$ 2,970,000	\$ 14,885,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,994,540	\$ 1,060,500	\$ 3,055,040
6. CONTROL HOUSE / PANELS	\$ 2,927,500	\$ 1,477,500	\$ 4,405,000
7. MISC ITEMS	\$ 1,441,675	\$ 2,331,950	\$ 3,773,625
8. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,965,087	\$ 8,278,271	\$ 10,243,358
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 26,528,676	\$ 27,732,656	\$ 54,261,332
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 26,528,676	\$ 27,732,656	\$ 54,261,332

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Rotterdam Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.9	ACRES	\$ -	\$ -	\$ 203,000	\$ 786,625	\$ 203,000	\$ 786,625
1.2	Station stone within substation fence.	3,175	CY	\$ 27	\$ 85,725	\$ 75	\$ 238,125	\$ 102	\$ 323,850
1.3	Substation Fence	2,130	LF	\$ 100	\$ 213,000	\$ 100	\$ 213,000	\$ 200	\$ 426,000
1.4	Retaining Wall (1065' x 13')	1	LS	\$ 406,755	\$ 406,755	\$ 925,345	\$ 925,345	\$ 1,332,100	\$ 1,332,100
1.5	Compacted Fill (124,583cy Sand)	124,583	CY	\$ 17	\$ 2,117,911	\$ 20	\$ 2,491,660	\$ 37	\$ 4,609,571
1.6	Permanent Access Road - 20'-Wide (From Gordon RD)	2,100	LF	\$ 35	\$ 73,500	\$ 285	\$ 598,500	\$ 320	\$ 672,000
1.7	Natural Gas Transmission Line Relocation	1	LS	\$ -	\$ -	\$ 2,800,000	\$ 2,800,000	\$ 2,800,000	\$ 2,800,000
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,896,891		\$ 8,053,255		\$ 10,950,146
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	8	EA	\$ 14,940	\$ 119,520	\$ 16,000	\$ 128,000	\$ 30,940	\$ 247,520
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	32	EA	\$ 26,145	\$ 836,640	\$ 28,000	\$ 896,000	\$ 54,145	\$ 1,732,640
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	102	EA	\$ 4,482	\$ 457,164	\$ 4,800	\$ 489,600	\$ 9,282	\$ 946,764
2.1f	Station Service Transformer Stand Foundation	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	42	EA	\$ 4,482	\$ 188,244	\$ 4,800	\$ 201,600	\$ 9,282	\$ 389,844
2.1j	Instrument Transformer Stand Foundations	33	EA	\$ 4,482	\$ 147,906	\$ 4,800	\$ 158,400	\$ 9,282	\$ 306,306
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	1	EA	\$ 11,952	\$ 11,952	\$ 12,800	\$ 12,800	\$ 24,752	\$ 24,752
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 22,410	\$ 89,640	\$ 24,000	\$ 96,000	\$ 46,410	\$ 185,640
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	8	EA	\$ 3,735	\$ 29,880	\$ 4,000	\$ 32,000	\$ 7,735	\$ 61,880
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	9	EA	\$ 3,735	\$ 33,615	\$ 4,000	\$ 36,000	\$ 7,735	\$ 69,615
2.2k	Arrester Stand Foundations	3	EA	\$ 3,735	\$ 11,205	\$ 4,000	\$ 12,000	\$ 7,735	\$ 23,205
2.2m	Wave Trap Stand Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 16,434	\$ 65,736	\$ 17,600	\$ 70,400	\$ 34,034	\$ 136,136
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.4b	345-115kV Transformer Foundation w/ Oil Containment	2	EA	\$ 74,700	\$ 149,400	\$ 80,000	\$ 160,000	\$ 154,700	\$ 309,400
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 2,443,003		\$ 2,616,200		\$ 5,059,203
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	8	EA	\$ 37,000	\$ 296,000	\$ 37,000	\$ 296,000	\$ 74,000	\$ 592,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	17	EA	\$ 14,800	\$ 251,600	\$ 14,800	\$ 251,600	\$ 29,600	\$ 503,200
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	42	EA	\$ 3,700	\$ 155,400	\$ 3,700	\$ 155,400	\$ 7,400	\$ 310,800
3.1g	Instrument Transformer Stand	33	EA	\$ 1,850	\$ 61,050	\$ 1,850	\$ 61,050	\$ 3,700	\$ 122,100
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ 33,300	\$ 33,300	\$ 33,300	\$ 33,300	\$ 66,600	\$ 66,600
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	2	EA	\$ 12,025	\$ 24,050	\$ 12,025	\$ 24,050	\$ 24,050	\$ 48,100
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	9	EA	\$ 1,295	\$ 11,655	\$ 1,295	\$ 11,655	\$ 2,590	\$ 23,310
3.2h	Arrester Stand	3	EA	\$ 1,295	\$ 3,885	\$ 1,295	\$ 3,885	\$ 2,590	\$ 7,770
3.2j	Wave Trap Stand	1	EA	\$ 5,550	\$ 5,550	\$ 5,550	\$ 5,550	\$ 11,100	\$ 11,100
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	2	EA	\$ 7,955	\$ 15,910	\$ 7,955	\$ 15,910	\$ 15,910	\$ 31,820
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 944,980		\$ 944,980		\$ 1,889,960
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	8	EA	\$ 200,000	\$ 1,600,000	\$ 80,000	\$ 640,000	\$ 280,000	\$ 2,240,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	1	EA	\$ 3,400,000	\$ 3,400,000	\$ 750,000	\$ 750,000	\$ 4,150,000	\$ 4,150,000
4.1d	345 kV - 115 kV Auto Transformer	2	EA	\$ 3,400,000	\$ 6,800,000	\$ 750,000	\$ 1,500,000	\$ 4,150,000	\$ 8,300,000
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	1	EA	\$ 115,000	\$ 115,000	\$ 80,000	\$ 80,000	\$ 195,000	\$ 195,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 11,915,000		\$ 2,970,000		\$ 14,885,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000
5.1b	Disconnect Switches - 3ph w/ manual operator	17	EA	\$ 35,000	\$ 595,000	\$ 17,500	\$ 297,500	\$ 52,500	\$ 892,500
5.1c	VT'S	6	EA	\$ 25,000	\$ 150,000	\$ 12,000	\$ 72,000	\$ 37,000	\$ 222,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	21	EA	\$ 13,000	\$ 273,000	\$ 8,000	\$ 168,000	\$ 21,000	\$ 441,000
5.1f	Arresters	15	EA	\$ 6,500	\$ 97,500	\$ 1,500	\$ 22,500	\$ 8,000	\$ 120,000
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	1	EA	\$ 35,000	\$ 35,000	\$ 15,000	\$ 15,000	\$ 50,000	\$ 50,000
5.2b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 30,000	\$ 30,000	\$ 17,500	\$ 17,500	\$ 47,500	\$ 47,500
5.2c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2e	CCVT'S	3	EA	\$ 10,000	\$ 30,000	\$ 6,000	\$ 18,000	\$ 16,000	\$ 48,000
5.2f	Arresters	6	EA	\$ 5,000	\$ 30,000	\$ 6,000	\$ 36,000	\$ 11,000	\$ 66,000
5.2g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	2	EA	\$ 8,000	\$ 16,000	\$ 8,000	\$ 16,000	\$ 16,000	\$ 32,000
5.3f	Arresters	12	EA	\$ 3,420	\$ 41,040	\$ 6,000	\$ 72,000	\$ 9,420	\$ 113,040
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,994,540		\$ 1,060,500		\$ 3,055,040
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 975,000	\$ 975,000	\$ 170,000	\$ 170,000	\$ 1,145,000	\$ 1,145,000
6.2	Protection and Telecom Equipment Panels	29	EA	\$ 35,000	\$ 1,015,000	\$ 10,000	\$ 290,000	\$ 45,000	\$ 1,305,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 472,500	\$ 472,500	\$ 472,500	\$ 472,500	\$ 945,000	\$ 945,000
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,927,500		\$ 1,477,500		\$ 4,405,000
<b>7. MISC ITEMS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.1	Conduit & Cable Trench System	1,950	LF	\$ 185.00	\$ 360,750	\$ 170.00	\$ 331,500	\$ 355	\$ 692,250
7.2	Rigid Bus, Fittings & Insulators	2,500	LF	\$ 125.07	\$ 312,675	\$ 237.10	\$ 592,750	\$ 362	\$ 905,425
7.3	Strain Bus, Connectors & Insulators	2,000	LF	\$ 39.30	\$ 78,600	\$ 53.35	\$ 106,700	\$ 93	\$ 185,300
7.4	Grounding System	25,000	LF	\$ 6.93	\$ 173,250	\$ 32.58	\$ 814,500	\$ 40	\$ 987,750
7.5	Strain Bus Insulators - 345kV	48	EA	\$ 2,000	\$ 96,000	\$ 1,050	\$ 50,400	\$ 3,050	\$ 146,400
7.6	Strain Bus Insulators - 230kV	6	EA	\$ 1,400	\$ 8,400	\$ 750	\$ 4,500	\$ 2,150	\$ 12,900
7.7	Strain Bus Insulators - 115kV	12	EA	\$ 1,000	\$ 12,000	\$ 550	\$ 6,600	\$ 1,550	\$ 18,600
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,441,675		\$ 2,331,950		\$ 3,773,625
<b>D. Rotterdam Substation - Install</b>					\$ 24,563,589		\$ 19,454,385		\$ 44,017,974
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 440,180	\$ 440,180	\$ 440,180	\$ 440,180
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,590,147	\$ 1,590,147	\$ 1,590,147	\$ 1,590,147
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 440,180	\$ 440,180	\$ 440,180	\$ 440,180
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 440,180	\$ 440,180	\$ 440,180	\$ 440,180
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,521,438	\$ 3,521,438	\$ 3,521,438	\$ 3,521,438
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 308,126	\$ 308,126	\$ 308,126	\$ 308,126
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,100,449	\$ 1,100,449	\$ 1,100,449	\$ 1,100,449
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 132,054	\$ 132,054	\$ 132,054	\$ 132,054
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 247,500	\$ 247,500	\$ 247,500	\$ 247,500

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,965,087	\$ 1,965,087	\$ -	\$ -	\$ 1,965,087	\$ 1,965,087
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 44,018	\$ 44,018	\$ 44,018	\$ 44,018
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,965,087		\$ 8,278,271		\$ 10,243,358

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**E. Rotterdam Substation - Removal**

Estimate Revision: **7** Total: \$ **4,153,136**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>E. Rotterdam Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 1,472,750	\$ 1,472,750
2. SUBSTATION FOUNDATIONS	\$ -	\$ 617,400	\$ 617,400
3. SUBSTATION STRUCTURES	\$ -	\$ 534,900	\$ 534,900
4. MAJOR EQUIPMENT	\$ -	\$ 147,000	\$ 147,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 169,500	\$ 169,500
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 519,480	\$ 519,480
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 542,106	\$ 542,106
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 4,153,136	\$ 4,153,136
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 4,153,136	\$ 4,153,136

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>E. Rotterdam Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	6.3	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,268,750	\$ 203,000	\$ 1,268,750
1.2	Station stone within substation fence.	2,000	CY	\$ -	\$ -	\$ 102	\$ 204,000	\$ 102	\$ 204,000
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 1,472,750		\$ 1,472,750
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	9	EA	\$ -	\$ -	\$ 7,200	\$ 64,800	\$ 7,200	\$ 64,800
2.2b	Capacitor Bank Foundations	2	EA	\$ -	\$ -	\$ 32,000	\$ 64,000	\$ 32,000	\$ 64,000
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	1	EA	\$ -	\$ -	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	15	EA	\$ -	\$ -	\$ 5,200	\$ 78,000	\$ 5,200	\$ 78,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	4	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	59	EA	\$ -	\$ -	\$ 2,400	\$ 141,600	\$ 2,400	\$ 141,600
2.2j	Instrument Transformer Stand Foundations	15	EA	\$ -	\$ -	\$ 2,400	\$ 36,000	\$ 2,400	\$ 36,000
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	3	EA	\$ -	\$ -	\$ 42,000	\$ 126,000	\$ 42,000	\$ 126,000
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 617,400		\$ 617,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ -	\$ -	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	15	EA	\$ -	\$ -	\$ 9,750	\$ 146,250	\$ 9,750	\$ 146,250
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	4	EA	\$ -	\$ -	\$ 2,250	\$ 9,000	\$ 2,250	\$ 9,000
3.2f	Bus Support 1 Ph	59	EA	\$ -	\$ -	\$ 2,250	\$ 132,750	\$ 2,250	\$ 132,750
3.2g	Instrument Transformer Stand	15	EA	\$ -	\$ -	\$ 1,050	\$ 15,750	\$ 1,050	\$ 15,750
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	3	EA	\$ -	\$ -	\$ 4,500	\$ 13,500	\$ 4,500	\$ 13,500
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 534,900		\$ 534,900
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	9	EA	\$ -	\$ -	\$ 7,000	\$ 63,000	\$ 7,000	\$ 63,000
4.2b	Capacitor Banks	2	EA	\$ -	\$ -	\$ 42,000	\$ 84,000	\$ 42,000	\$ 84,000
<b>4.3 115kV</b>									
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 147,000		\$ 147,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2b	Disconnect Switches - 3ph w/ manual operator	12	EA	\$ -	\$ -	\$ 5,500	\$ 66,000	\$ 5,500	\$ 66,000
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	8	EA	\$ -	\$ -	\$ 1,500	\$ 12,000	\$ 1,500	\$ 12,000
5.2f	Arresters	15	EA	\$ -	\$ -	\$ 2,500	\$ 37,500	\$ 2,500	\$ 37,500
5.2g	Wave Traps	3	EA	\$ -	\$ -	\$ 2,500	\$ 7,500	\$ 2,500	\$ 7,500
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 169,500		\$ 169,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.2	Rigid Bus, Fittings & Insulators	3,200	LF	\$ -	\$ -	\$ 126.25	\$ 404,000	\$ 126	\$ 404,000
7.3	Strain Bus, Connectors & Insulators	800	LF	\$ -	\$ -	\$ 39.35	\$ 31,480	\$ 39	\$ 31,480
7.4	Grounding System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.5									
7.6									
7.7									
7.8									
7.9									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 519,480		\$ 519,480
<b>E. Rotterdam Substation - Removal</b>					\$ -		\$ 3,611,030		\$ 3,611,030
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 130,448	\$ 130,448	\$ 130,448	\$ 130,448
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 288,882	\$ 288,882	\$ 288,882	\$ 288,882
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 25,277	\$ -	\$ 25,277	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 90,276	\$ -	\$ 90,276	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 10,833	\$ 10,833	\$ 10,833	\$ 10,833
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 3,611	\$ 3,611	\$ 3,611	\$ 3,611
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 542,106		\$ 542,106

Estimate Revision: **7** Total: \$ **2,607,956**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>F. Edic Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,025	\$ 5,625	\$ 7,650
2. SUBSTATION FOUNDATIONS	\$ 100,098	\$ 107,200	\$ 207,298
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 280,000	\$ 133,500	\$ 413,500
6. CONTROL HOUSE / PANELS	\$ 173,850	\$ 98,850	\$ 272,700
7. MISC ITEMS	\$ 339,357	\$ 507,880	\$ 847,237
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 91,178	\$ 399,592	\$ 490,771
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,230,908	\$ 1,377,047	\$ 2,607,956
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,230,908	\$ 1,377,047	\$ 2,607,956

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Edic Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide (From Gordon RD)	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,025		\$ 5,625		\$ 7,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 100,098	\$ 107,200	\$ 207,298		
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 280,000		\$ 133,500		\$ 413,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 10,000	\$ 30,000	\$ 45,000	\$ 135,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 68,850	\$ 68,850	\$ 68,850	\$ 68,850	\$ 137,700	\$ 137,700
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 173,850		\$ 98,850		\$ 272,700
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	L.S.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 39.30	\$ 98,250	\$ 53.35	\$ 133,375	\$ 93	\$ 231,625
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 73,305.00	\$ 73,305	\$ 83,700	\$ 83,700
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 339,357		\$ 507,880		\$ 847,237
<b>F. Edic Substation - Install</b>					\$ 1,139,730		\$ 977,455		\$ 2,117,185
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 76,483	\$ 76,483	\$ 76,483	\$ 76,483
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 169,375	\$ 169,375	\$ 169,375	\$ 169,375
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,820	\$ 14,820	\$ 14,820	\$ 14,820
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,930	\$ 52,930	\$ 52,930	\$ 52,930
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,352	\$ 6,352	\$ 6,352	\$ 6,352

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 91,178	\$ 91,178	\$ -	\$ -	\$ 91,178	\$ 91,178
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,117	\$ 2,117	\$ 2,117	\$ 2,117
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 91,178		\$ 399,592		\$ 490,771

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**G. Edic Substation - Removal**

Estimate Revision: **7**

Total: \$ **41,311**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>G. Edic Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 14,200	\$ 14,200
3. SUBSTATION STRUCTURES	\$ -	\$ 6,750	\$ 6,750
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 10,500	\$ 10,500
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 5,361	\$ 5,361
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 41,311	\$ 41,311
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 41,311	\$ 41,311

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Edic Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 14,200	\$ 14,200	\$ 14,200	\$ 14,200
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 14,200		\$ 14,200
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	3	EA	\$ -	\$ -	\$ 2,250	\$ 6,750	\$ 2,250	\$ 6,750
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 6,750		\$ 6,750
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 10,500.00	\$ 10,500	\$ 10,500	\$ 10,500
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 10,500		\$ 10,500
<b>G. Edic Substation - Removal</b>					\$ -		\$ 35,950		\$ 35,950
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,299	\$ 1,299	\$ 1,299	\$ 1,299
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 360	\$ 360	\$ 360	\$ 360
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,876	\$ 2,876	\$ 2,876	\$ 2,876
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 252	\$ -	\$ 252	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 899	\$ -	\$ 899	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 108	\$ 108	\$ 108	\$ 108
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 36	\$ -	\$ 36	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 5,361		\$ 5,361

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**H. Princetown Switchyard - Install**

Estimate Revision: **7**

Total: \$ **15,771,722**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>H. Princetown Switchyard - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 163,560	\$ 904,700	\$ 1,068,260
2. SUBSTATION FOUNDATIONS	\$ 1,193,706	\$ 1,213,490	\$ 2,407,196
3. SUBSTATION STRUCTURES	\$ 582,750	\$ 582,750	\$ 1,165,500
4. MAJOR EQUIPMENT	\$ 800,000	\$ 320,000	\$ 1,120,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,382,000	\$ 636,000	\$ 2,018,000
6. CONTROL HOUSE / PANELS	\$ 1,621,800	\$ 1,043,550	\$ 2,665,350
7. MISC ITEMS	\$ 895,854	\$ 1,373,004	\$ 2,268,858
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 531,174	\$ 2,527,384	\$ 3,058,558
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 7,170,844	\$ 8,600,878	\$ 15,771,722
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 7,170,844	\$ 8,600,878	\$ 15,771,722

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. Princetown Switchyard - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.1	ACRES	\$ -	\$ -	\$ 203,000	\$ 629,300	\$ 203,000	\$ 629,300
1.2	Station stone within substation fence.	1,080	CY	\$ 27	\$ 29,160	\$ 75	\$ 81,000	\$ 102	\$ 110,160
1.3	Substation Fence	1,260	LF	\$ 100	\$ 126,000	\$ 100	\$ 126,000	\$ 200	\$ 252,000
1.4	Permanent Access Road - 20'-Wide (Extend Existing)	240	LF	\$ 35	\$ 8,400	\$ 285	\$ 68,400	\$ 320	\$ 76,800
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 163,560		\$ 904,700		\$ 1,068,260
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 765kV</b>									
2.1a	Circuit Breaker Foundations		EA.	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.1b	Capacitor Bank Foundations		EA.	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)		EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1e	Switch Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA.	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 1ph Foundations (High Bus)		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations (Low Bus)		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1j	Instrument Transformer Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1k	Arrester Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1m	Wave Trap Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1n	Misc. Structure Foundations	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 345kV</b>									
2.2a	Circuit Breaker Foundations	4	EA.	\$ 14,940	\$ 59,760	\$ 14,940	\$ 59,760	\$ 29,880	\$ 119,520
2.2b	Capacitor Bank Foundations	0	EA.	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	16	EA.	\$ 26,145	\$ 418,320	\$ 26,145	\$ 418,320	\$ 52,290	\$ 836,640
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA.	\$ 26,145	\$ -	\$ 26,145	\$ -	\$ 52,290	\$ -
2.2e	Switch Stand Foundations	48	EA.	\$ 4,482	\$ 215,136	\$ 4,482	\$ 215,136	\$ 8,964	\$ 430,272
2.2f	Station Service Transformer Stand Foundation	6	EA.	\$ 4,482	\$ 26,892	\$ 4,482	\$ 26,892	\$ 8,964	\$ 53,784

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 1ph Foundations (High Bus)	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations (Low Bus)	39	EA.	\$ 4,482	\$ 174,798	\$ 4,482	\$ 174,798	\$ 8,964	\$ 349,596
2.2j	Instrument Transformer Stand Foundations	36	EA.	\$ 4,482	\$ 161,352	\$ 4,482	\$ 161,352	\$ 8,964	\$ 322,704
2.2k	Arrester Stand Foundations	12	EA.	\$ 4,482	\$ 53,784	\$ 4,482	\$ 53,784	\$ 8,964	\$ 107,568
2.2m	Wave Trap Stand Foundations	4	EA.	\$ 4,482	\$ 17,928	\$ 4,482	\$ 17,928	\$ 8,964	\$ 35,856
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	765-345kV Transformer Foundation w/ Oil Containment		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	765-345kV Transformer Fire Wall		EA.	\$ 106,074	\$ -	\$ 113,600	\$ -	\$ 219,674	\$ -
2.4c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad / Generator / Station Service Distribution Line</b>								
2.5a	Control House / Pad - 25' x 50'	1	EA	\$ 17,928	\$ 17,928	\$ 19,200	\$ 19,200	\$ 37,128	\$ 37,128
2.5b	Generator Foundation	1	EA	\$ 16,434	\$ 16,434	\$ 17,600	\$ 17,600	\$ 34,034	\$ 34,034
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 15,120	\$ 15,120	\$ 15,120	\$ 15,120
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	6	EA	\$ 5,229	\$ 31,374	\$ 5,600	\$ 33,600	\$ 10,829	\$ 64,974
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,193,706		\$ 1,213,490		\$ 2,407,196
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>765kV</b>								
3.1a	Substation A-Frame Structures - Stand alone		EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column		EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1c	Switch Stands		EA.	\$ 22,200	\$ -	\$ 22,200	\$ -	\$ 44,400	\$ -
3.1d	Station Service Transformer Stand		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 1ph (High Bus)		EA.	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1f	Bus Support 1 Ph (low Bus)		EA.	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.1g	Instrument Transformer Stand		EA.	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1h	Arrester Stand		EA.	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1j	Wave Trap Stand		EA.	\$ 9,250	\$ -	\$ 9,250	\$ -	\$ 18,500	\$ -
3.1k	Lightning Mast		EA.	\$ 9,250	\$ -	\$ 9,250	\$ -	\$ 18,500	\$ -
<b>3.2</b>	<b>345kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	4	EA	\$ 37,000	\$ 148,000	\$ 37,000	\$ 148,000	\$ 74,000	\$ 296,000
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.2c	Switch Stands	8	EA	\$ 14,800	\$ 118,400	\$ 14,800	\$ 118,400	\$ 29,600	\$ 236,800
3.2d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.2e	Bus Support 3ph	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2f	Bus Support 1 Ph	39	EA	\$ 3,700	\$ 144,300	\$ 3,700	\$ 144,300	\$ 7,400	\$ 288,600
3.2g	Instrument Transformer Stand	36	EA	\$ 1,850	\$ 66,600	\$ 1,850	\$ 66,600	\$ 3,700	\$ 133,200
3.2h	Arrester Stand	12	EA	\$ 1,850	\$ 22,200	\$ 1,850	\$ 22,200	\$ 3,700	\$ 44,400
3.2j	Wave Trap Stand	4	EA	\$ 7,400	\$ 29,600	\$ 7,400	\$ 29,600	\$ 14,800	\$ 59,200
3.2k	Misc. Structures	6	EA	\$ 6,475	\$ 38,850	\$ 6,475	\$ 38,850	\$ 12,950	\$ 77,700

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 582,750		\$ 582,750		\$ 1,165,500
<b>4. MAJOR EQUIPMENT</b>									
<b>4.2</b>	<b>345kV</b>								
4.2a	Circuit Breakers	4	EA	\$ 200,000	\$ 800,000	\$ 80,000	\$ 320,000	\$ 280,000	\$ 1,120,000
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 800,000		\$ 320,000		\$ 1,120,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.2</b>	<b>345kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	4	EA	\$ 40,000	\$ 160,000	\$ 15,000	\$ 60,000	\$ 55,000	\$ 220,000
5.2b	Disconnect Switches - 3ph w/ manual operator	8	EA	\$ 35,000	\$ 280,000	\$ 17,500	\$ 140,000	\$ 52,500	\$ 420,000
5.2c	VT'S	12	EA	\$ 25,000	\$ 300,000	\$ 12,000	\$ 144,000	\$ 37,000	\$ 444,000
5.2d	CT'S	12	EA	\$ 13,000	\$ 156,000	\$ 8,000	\$ 96,000	\$ 21,000	\$ 252,000
5.2e	CCVT'S	12	EA	\$ 13,000	\$ 156,000	\$ 8,000	\$ 96,000	\$ 21,000	\$ 252,000
5.2f	Arresters	12	EA	\$ 6,500	\$ 78,000	\$ 1,500	\$ 18,000	\$ 8,000	\$ 96,000
5.2g	Wave Traps	4	EA	\$ 13,000	\$ 52,000	\$ 8,000	\$ 32,000	\$ 21,000	\$ 84,000
5.2h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,382,000		\$ 636,000		\$ 2,018,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 245,750	\$ 245,750	\$ 37,500	\$ 37,500	\$ 283,250	\$ 283,250
6.2	Protection and Telecom Equipment Panels	18	EA	\$ 35,000	\$ 630,000	\$ 10,000	\$ 180,000	\$ 45,000	\$ 810,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 281,050	\$ 281,050	\$ 281,050	\$ 281,050	\$ 562,100	\$ 562,100
6.5	SCADA and Communications	0	EA	\$ 35,000	\$ -	\$ 12,500	\$ -	\$ 47,500	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,621,800		\$ 1,043,550		\$ 2,665,350
<b>7. MISC ITEMS 345kV</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.15	Conduit & Cable Trench System	1,200	LF	\$ 125.07	\$ 150,084	\$ 170.00	\$ 204,000	\$ 295	\$ 354,084
7.16	Rigid Bus, Fittings & Insulators	1,000	LF	\$ 125.07	\$ 125,070	\$ 237.10	\$ 237,100	\$ 362	\$ 362,170
7.17	Strain Bus, Connectors & Insulators	1,600	LF	\$ 61.50	\$ 98,400	\$ 78.69	\$ 125,904	\$ 140	\$ 224,304
7.18	Grounding System	10,000	LF	\$ 6.93	\$ 69,300	\$ 32.58	\$ 325,800	\$ 40	\$ 395,100
7.19	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.20	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.21	SSVT Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.22	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.23	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.24									
7.25									
7.26									
7.27									
7.28									
7.29									
<b>TOTAL - MISC ITEMS</b>					\$ 895,854		\$ 1,373,004		\$ 2,268,858
<b>H. Princetown Switchyard - Install</b>					\$ 6,639,670		\$ 6,073,494		\$ 12,713,164
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 127,132	\$ 127,132	\$ 127,132	\$ 127,132
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 459,262	\$ 459,262	\$ 459,262	\$ 459,262
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 127,132	\$ 127,132	\$ 127,132	\$ 127,132
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 127,132	\$ 127,132	\$ 127,132	\$ 127,132
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,017,053	\$ 1,017,053	\$ 1,017,053	\$ 1,017,053
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 88,992	\$ 88,992	\$ 88,992	\$ 88,992
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 317,829	\$ 317,829	\$ 317,829	\$ 317,829
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 38,139	\$ 38,139	\$ 38,139	\$ 38,139
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 198,000	\$ 198,000	\$ 198,000	\$ 198,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 531,174	\$ 531,174	\$ -	\$ -	\$ 531,174	\$ 531,174
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 12,713	\$ 12,713	\$ 12,713	\$ 12,713
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 531,174		\$ 2,527,384		\$ 3,058,558

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**J. Porter Substation - Install**

Estimate Revision: **7**

Total: \$ **86,210**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ 15,008	\$ 56,904	\$ 71,912
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,201	\$ 13,097	\$ 14,298
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 16,209	\$ 70,001	\$ 86,210
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 16,209	\$ 70,001	\$ 86,210

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Porter Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ -		\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ 35,000	\$ -	\$ 10,000	\$ -	\$ 45,000	\$ -
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ 15,008.40	\$ 15,008	\$ 56,904.00	\$ 56,904	\$ 71,912	\$ 71,912
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.11	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>J. Porter Substation - Install</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,598	\$ 2,598	\$ 2,598	\$ 2,598
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 719	\$ 719	\$ 719	\$ 719
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,753	\$ 5,753	\$ 5,753	\$ 5,753
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 503	\$ 503	\$ 503	\$ 503
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,798	\$ 1,798	\$ 1,798	\$ 1,798

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 216	\$ 216	\$ 216	\$ 216
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,201	\$ 1,201	\$ -	\$ -	\$ 1,201	\$ 1,201
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 72	\$ 72	\$ 72	\$ 72
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,201		\$ 13,097		\$ 14,298

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**K. Porter Substation - Removal**

Estimate Revision: **7**

Total: \$ **545,044**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>K. Porter Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 126,600	\$ 126,600
3. SUBSTATION STRUCTURES	\$ -	\$ 206,100	\$ 206,100
4. MAJOR EQUIPMENT	\$ -	\$ 43,500	\$ 43,500
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 59,500	\$ 59,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 38,613	\$ 38,613
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 70,732	\$ 70,732
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 545,044	\$ 545,044
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 545,044	\$ 545,044

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Porter Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	3	EA	\$ -	\$ -	\$ 7,200	\$ 21,600	\$ 7,200	\$ 21,600
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	5	EA	\$ -	\$ -	\$ 5,200	\$ 26,000	\$ 5,200	\$ 26,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	4	EA	\$ -	\$ -	\$ 2,400	\$ 9,600	\$ 2,400	\$ 9,600
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 126,600		\$ 126,600
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	6	EA	\$ -	\$ -	\$ 9,750	\$ 58,500	\$ 9,750	\$ 58,500
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 206,100		\$ 206,100
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	3	EA	\$ -	\$ -	\$ 14,500	\$ 43,500	\$ 14,500	\$ 43,500
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 43,500		\$ 43,500
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	2	EA	\$ -	\$ -	\$ 5,500	\$ 11,000	\$ 5,500	\$ 11,000
5.2b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2c	VT'S	2	EA	\$ -	\$ -	\$ 1,500	\$ 3,000	\$ 1,500	\$ 3,000
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	6	EA	\$ -	\$ -	\$ 1,500	\$ 9,000	\$ 1,500	\$ 9,000
5.2f	Arresters	6	EA	\$ -	\$ -	\$ 2,500	\$ 15,000	\$ 2,500	\$ 15,000
5.2g	Wave Traps	2	EA	\$ -	\$ -	\$ 2,500	\$ 5,000	\$ 2,500	\$ 5,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 59,500		\$ 59,500

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ -	\$ -	\$ 18,937.50	\$ 18,938	\$ 18,938	\$ 18,938
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ -	\$ -	\$ 19,675.00	\$ 19,675	\$ 19,675	\$ 19,675
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 38,613		\$ 38,613
<b>K. Porter Substation - Removal</b>					\$ -		\$ 474,313		\$ 474,313
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 17,135	\$ 17,135	\$ 17,135	\$ 17,135
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 37,945	\$ 37,945	\$ 37,945	\$ 37,945
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 3,320	\$ -	\$ 3,320	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 11,858	\$ -	\$ 11,858	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,423	\$ 1,423	\$ 1,423	\$ 1,423
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 474	\$ -	\$ 474	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 70,732		\$ 70,732

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**L. Interconnection Edic Station**

Estimate Revision: **7** Total: \$ **2,100,762**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>L. Interconnection Edic Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 168,366	\$ 170,169	\$ 338,536
3. STRUCTURES	\$ 501,469	\$ 321,821	\$ 823,289
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 160,000	\$ 94,400	\$ 254,400
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 66,387	\$ 250,300	\$ 316,687
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,204,541</b>	\$ <b>2,100,762</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,204,541</b>	\$ <b>2,100,762</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Edic Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ -	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation - Drilled Pier - 8'X 27'	3	EA	\$ 41,332	\$ 123,995	\$ 41,774	\$ 125,322	\$ 83,106	\$ 249,317
2.2	Foundation - Drilled Pier - 8'X 29'	1	EA	\$ 44,372	\$ 44,372	\$ 44,847	\$ 44,847	\$ 89,219	\$ 89,219
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 168,366		\$ 170,169		\$ 338,536
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) – 105'	3	Structure	\$ 98,883	\$ 296,648	\$ 59,330	\$ 177,989	\$ 158,212	\$ 474,636
3.2	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.3	Install Grounding and Grounding Accessories	4	Pole	\$ 506	\$ 2,024	\$ 5,539	\$ 22,154	\$ 6,045	\$ 24,178
3.4					\$ -		\$ -		\$ -
3.5					\$ -		\$ -		\$ -
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 501,469		\$ 321,821		\$ 823,289
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 3.53	\$ -	\$ 5.00	\$ -	\$ 8.53	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.55	\$ -	\$ 5.00	\$ -	\$ 6.55	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.72	\$ -	\$ 5.00	\$ -	\$ 5.72	\$ -
4.5	Remove Existing Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -	\$ -	\$ -	\$ -	\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)								
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)								
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)								
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.10	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.11	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15					\$ -		\$ -		\$ -
5.16					\$ -		\$ -		\$ -
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 160,000		\$ 94,400		\$ 254,400
<b>L. Interconnection Edic Station</b>					\$ 829,835		\$ 954,240		\$ 1,784,075
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 64,450	\$ 64,450	\$ 64,450	\$ 64,450

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 89,204	\$ 89,204	\$ 89,204	\$ 89,204
6.6	LIDAR	-	LS	\$ -	\$ -	\$ 5,352	\$ -	\$ 5,352	\$ -
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,489	\$ 12,489	\$ 12,489	\$ 12,489
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,352	\$ 5,352	\$ 5,352	\$ 5,352
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 66,387	\$ 66,387	\$ -	\$ -	\$ 66,387	\$ 66,387
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 1,784	\$ 1,784	\$ 1,784	\$ 1,784
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 66,387		\$ 250,300		\$ 316,687

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**M. Interconnection New Scotland Station**

Estimate  
Revision: 7

Total: \$ 3,070,215

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>M. Interconnection New Scotland Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 365,657	\$ 473,093	\$ 838,749
3. STRUCTURES	\$ 655,465	\$ 445,628	\$ 1,101,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,555	\$ 26,100	\$ 29,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 161,130	\$ 95,795	\$ 256,925
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 94,864	\$ 381,079	\$ 475,944
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,280,670	\$ 1,789,545	\$ 3,070,215
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,280,670	\$ 1,789,545	\$ 3,070,215

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection New Scotland Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 50’	3	EA	\$ 76,500	\$ 229,501	\$ 77,320	\$ 231,959	\$ 153,820	\$ 461,459
2.2	Foundation – Drilled Pier – 8’X 89’	1	EA	\$ 136,156	\$ 136,156	\$ 137,614	\$ 137,614	\$ 273,770	\$ 273,770
2.3	Rock Excavation Adder	51.8	CY	\$ -	\$ -	\$ 2,000	\$ 103,520	\$ 2,000	\$ 103,520
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.15					\$ 365,657		\$ 473,093		\$ 838,749
<b>TOTAL - FOUNDATIONS</b>									
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	3	Structure	\$ 178,026	\$ 534,077	\$ 106,815	\$ 320,446	\$ 284,841	\$ 854,522
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	Install Grounding and Grounding Accessories	10	Structure	\$ 506	\$ 5,060	\$ 5,539	\$ 55,385	\$ 6,045	\$ 60,445
3.4					\$ -		\$ -		
3.5									
3.6					\$ -		\$ -		
3.7					\$ -		\$ -		
3.8					\$ -		\$ -		
3.9					\$ -		\$ -		
3.10					\$ -		\$ -		
3.11					\$ -		\$ -		
3.12					\$ -		\$ -		
3.13					\$ -		\$ -		
3.14					\$ -		\$ -		
3.15					\$ -		\$ -		
<b>TOTAL - STRUCTURES</b>									
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (2) 954kcmil 54/7 ACSS "Cardinal"	1,500	LF	\$ 1.90	\$ 2,850	\$ 5.00	\$ 7,500	\$ 6.90	\$ 10,350
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	1,500	LF	\$ 0.47	\$ 705	\$ 5.00	\$ 7,500	\$ 5.47	\$ 8,205
4.5	Remove Existing 345KV Cable From Existing Structures	0.3	Mile	\$ -	\$ -	\$ 30,000	\$ 7,500	\$ 30,000.00	\$ 7,500
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	0.3	Mile	\$ -	\$ -	\$ 12,000	\$ 3,600	\$ 12,000.00	\$ 3,600
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>									
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.10	Spacer - Conductor	9	EA	\$ 50	\$ 450	\$ 35	\$ 315	\$ 85	\$ 765
5.11	Vibration Dampers - Conductor	48	EA	\$ 35	\$ 1,680	\$ 35	\$ 1,680	\$ 70	\$ 3,360
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15					\$ -		\$ -		\$ -
5.16	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19					\$ -		\$ -		\$ -
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>									
<b>M. Interconnection New Scotland Station</b>									
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 93,718	\$ 93,718	\$ 93,718	\$ 93,718

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 129,714	\$ 129,714	\$ 129,714	\$ 129,714
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 18,160	\$ 18,160	\$ 18,160	\$ 18,160
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 94,864	\$ 94,864	\$ -	\$ -	\$ 94,864	\$ 94,864
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,594	\$ 2,594	\$ 2,594	\$ 2,594
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 94,864	\$ 2,594	\$ 381,079	\$ 475,944	\$ 475,944

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**N. Interconnection Rotterdam Station**

Estimate Revision: **7** Total: \$ **4,553,958**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>N. Interconnection Rotterdam Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,233,050	\$ 1,233,050
2. FOUNDATIONS	\$ 192,145	\$ 325,963	\$ 518,108
3. STRUCTURES	\$ 546,722	\$ 837,150	\$ 1,383,872
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 65,923	\$ 437,250	\$ 503,173
5. INSULATORS, FITTINGS, HARDWARE	\$ 165,730	\$ 118,480	\$ 284,210
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 77,642	\$ 553,904	\$ 631,545
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,505,797</b>	<b>\$ 4,553,958</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,505,797</b>	<b>\$ 4,553,958</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Rotterdam Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	7.0	Acre	\$ -	\$ -	\$ 15,000	\$ 105,000	\$ 15,000	\$ 105,000
1.2	Clearing the ROW - Light (mowing)	5.0	Acre	\$ -	\$ -	\$ 5,000	\$ 25,000	\$ 5,000	\$ 25,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	4,800.0	LF	\$ -	\$ -	\$ 4	\$ 19,200	\$ 4	\$ 19,200
1.5	Matting - Access and ROW	4,800.0	LF	\$ -	\$ -	\$ 70	\$ 336,000	\$ 70	\$ 336,000
1.6	Matting - To Work Area	2,400.0	LF	\$ -	\$ -	\$ 70	\$ 168,000	\$ 70	\$ 168,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	1.0	Mile	\$ -	\$ -	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
1.9	Work Pads	160,000.0	SF	\$ -	\$ -	\$ 4	\$ 563,200	\$ 4	\$ 563,200
1.10	Restoration for Work Pad areas	32,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 4,800	\$ 0	\$ 4,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 1,233,050		\$ 1,233,050
<b>2. FOUNDATIONS</b>									
2.1	10' ED Rock BF	6	EA	\$ 358	\$ 2,145	\$ 3,575	\$ 21,450	\$ 3,933	\$ 23,595
2.2	15' ED Rock BF	18	EA	\$ 536	\$ 9,653	\$ 5,363	\$ 96,525	\$ 5,899	\$ 106,178
2.3	20' ED Rock BF	4	EA	\$ 715	\$ 2,860	\$ 7,150	\$ 28,600	\$ 7,865	\$ 31,460
2.4	Foundation - Drilled Pier - 8'X 29'	4	EA	\$ 44,372	\$ 177,487	\$ 44,847	\$ 179,388	\$ 89,219	\$ 356,875
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 192,145		\$ 325,963		\$ 518,108
<b>3. STRUCTURES</b>									
3.1	15kv 3-CKT TANGENT DIST. - WOOD POLE	3	Pole	\$ 3,500	\$ 10,500	\$ 3,600	\$ 10,800	\$ 7,100	\$ 21,300
3.2	15kv 3-CKT MA DIST. - WOOD POLE	1	Pole	\$ 3,500	\$ 3,500	\$ 3,600	\$ 3,600	\$ 7,100	\$ 7,100
3.3	15kv 3-CKT DE - WOOD POLE	2	Pole	\$ 3,500	\$ 7,000	\$ 3,600	\$ 7,200	\$ 7,100	\$ 14,200
3.4	115kv 1-CKT TANGENT - WOOD POLE	5	Pole	\$ 4,500	\$ 22,500	\$ 4,400	\$ 22,000	\$ 8,900	\$ 44,500
3.5	115kv 1-CKT MA - WOOD POLE	2	Pole	\$ 4,500	\$ 9,000	\$ 4,400	\$ 8,800	\$ 8,900	\$ 17,800
3.6	115kv 1-CKT DE - WOOD POLE	11	Pole	\$ 5,500	\$ 60,500	\$ 5,000	\$ 55,000	\$ 10,500	\$ 115,500
3.7	115kv 2-CKT TANGENT - WOOD POLE	4	Pole	\$ 5,500	\$ 22,000	\$ 5,000	\$ 20,000	\$ 10,500	\$ 42,000
3.8	115kv 2-CKT DE - STEEL POLE	4	Pole	\$ 98,883	\$ 395,530	\$ 59,330	\$ 237,318	\$ 158,212	\$ 632,848
3.9	Remove Existing Structure	24	EA		\$ -	\$ 12,300	\$ 295,200	\$ 12,300	\$ 295,200
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12	Install Grounding and Grounding Accessories	32	Structure	\$ 506	\$ 16,192	\$ 5,539	\$ 177,232	\$ 6,045	\$ 193,424
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 546,722		\$ 837,150		\$ 1,383,872
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	23,400	LF	\$ 1.90	\$ 44,460	\$ 5.00	\$ 117,000	\$ 6.90	\$ 161,460
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	7,800	LF	\$ 0.47	\$ 3,666	\$ 5.00	\$ 39,000	\$ 5.47	\$ 42,666
4.5	Remove Existing Cable	6.6	Mile	\$ -	\$ -	\$ 30,000	\$ 197,700	\$ 30,000.00	\$ 197,700
4.6	Remove Existing EHT	2.2	Mile	\$ -	\$ -	\$ 12,000	\$ 26,400	\$ 12,000.00	\$ 26,400
4.7	15kv - (1) 477kcmil 26/7 ACSR "Hawk"	9,630	LF	\$ 1.62	\$ 15,601	\$ 5.00	\$ 48,150	\$ 6.62	\$ 63,751
4.8	15kv - (1) 336kcmil 26/7 ACSR "Linnet"	1,800	LF	\$ 1.22	\$ 2,196	\$ 5.00	\$ 9,000	\$ 6.22	\$ 11,196
4.9		-							
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 65,923		\$ 437,250		\$ 503,173
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	115kv Tangent (1-Group of 9-Bells Each Assembly)	33	Assembly	\$ 1,000	\$ 33,000	\$ 560	\$ 18,480	\$ 1,560	\$ 51,480
5.2	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	66	Assembly	\$ 1,000	\$ 66,000	\$ 560	\$ 36,960	\$ 1,560	\$ 102,960
5.3	15kv Tangent	12	Assembly	\$ 100	\$ 1,200	\$ 75	\$ 900	\$ 175	\$ 2,100
5.4	15kv Dead-end & Angle Insulators	18	Assembly	\$ 100	\$ 1,800	\$ 75	\$ 1,350	\$ 175	\$ 3,150
5.5	Neutral, Distribution, Tangent	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.6	Neutral, Distribution, DE/Side	2	Assembly	\$ 100	\$ 200	\$ 75	\$ 150	\$ 175	\$ 350
5.7	Jumper, DE/Angle, 3PH	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.8	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OSHW Assembly - Tangent	11	Assembly	\$ 250	\$ 2,750	\$ 150	\$ 1,650	\$ 400	\$ 4,400
5.10	OHSW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.11	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.12	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.13	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.14	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.16	Guys, Anchors, and Accessories	14.0	EA	\$ 720	\$ 10,080	\$ 885	\$ 12,390	\$ 1,605	\$ 22,470
5.17	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	8	EA	\$ 5,000	\$ 40,000	\$ 5,000	\$ 40,000	\$ 10,000	\$ 80,000
5.20					\$ -		\$ -		\$ -
5.21					\$ -		\$ -		\$ -
5.22					\$ -		\$ -		\$ -
5.23					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 165,730		\$ 118,480		\$ 284,210
<b>N. Interconnection Rotterdam Station</b>					\$ 970,519		\$ 2,951,893		\$ 3,922,412
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
Contractor Mobilization / Demobilization									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 141,697	\$ 141,697	\$ 141,697	\$ 141,697
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 196,121	\$ 196,121	\$ 196,121	\$ 196,121
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 27,457	\$ 27,457	\$ 27,457	\$ 27,457
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 77,642	\$ 77,642	\$ -	\$ -	\$ 77,642	\$ 77,642
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 3,922	\$ 3,922	\$ 3,922	\$ 3,922
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 77,642		\$ 553,904		\$ 631,545

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**System Upgrade Facilities (765kV Corona Mitigation)**

Estimate  
Revision: 7

**Total: \$ 103,575,563**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>SUF 1</b>	<b>Transmission</b>								
1.1	765kV S/C (2)-Steel H-Pole Tangent Structure (125ft.) w/ Foundation	48.00	EA	\$ 238,985	\$ 11,471,280	\$ 194,435	\$ 9,332,880	\$ 433,420	\$ 20,804,160
1.2	765kV S/C (2)-Steel H-Pole Tangent Structure (145ft.) w/ Foundation	10.00	EA	\$ 275,985	\$ 2,759,850	\$ 216,635	\$ 2,166,350	\$ 492,620	\$ 4,926,200
1.3	765kV S/C (2)-Steel H-Pole Tangent Structure (265ft.) w/ Foundation	1.00	EA	\$ 585,200	\$ 585,200	\$ 451,850	\$ 451,850	\$ 1,037,050	\$ 1,037,050
1.4	765kV S/C (2)-Steel H-Pole Tangent Structure (275ft.) w/ Foundation	1.00	EA	\$ 540,700	\$ 540,700	\$ 398,150	\$ 398,150	\$ 938,850	\$ 938,850
1.5	765kV S/C 3-Steel Pole Medium Angle Structure (130ft.) W/ Foundation	15.00	EA	\$ 947,650	\$ 14,214,750	\$ 776,150	\$ 11,642,250	\$ 1,723,800	\$ 25,857,000
1.6	765kV S/C 3-Steel Pole Medium Angle Structure (150ft.) W/ Foundation	2.00	EA	\$ 1,086,400	\$ 2,172,800	\$ 859,400	\$ 1,718,800	\$ 1,945,800	\$ 3,891,600
1.7	Conductor and Accessories	1.00	LS	\$ 5,209,340	\$ 5,209,340	\$ 5,819,250	\$ 5,819,250	\$ 11,028,590	\$ 11,028,590
1.8	Hardware Replacement on Existing Tangent Structures (From Church Rd to New Scotland Bypass)	1.00	LS	\$ 3,150,000	\$ 3,150,000	\$ 4,725,000	\$ 4,725,000	\$ 7,875,000	\$ 7,875,000
1.9	Hardware Replacement on Existing Angle/Deadend Structures (From Church Rd to New Scotland Bypass)	1.00	LS	\$ 1,530,000	\$ 1,530,000	\$ 2,652,000	\$ 2,652,000	\$ 4,182,000	\$ 4,182,000
1.10	Removal of Existing Structures and Conductor (From New Scotland Bypass to Knickerbocker)	1.00	LS	\$ -	\$ -	\$ 2,320,000	\$ 2,320,000	\$ 2,320,000	\$ 2,320,000
	<b>Subtotal Direct Cost</b>				\$ 41,633,920		\$ 41,226,530		\$ 82,860,450
1.11	<b>Indirect Cost (25% of Direct Cost)</b>								\$ 20,715,113
	<b>TOTAL:</b>								\$ 103,575,563

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**System Upgrade Facilities (Various Stations for Edic/Marcy to New Scotland)**

Estimate Revision: **7**

**Total: \$ 6,899,000**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
SUF SS1	Marcy 345kV Bay 3300 - Reconductor Strain Bus UNS-18 Marcy-New Scotland Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 664,560	\$ 665,000
SUF SS1	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 30,000
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 174,000
<b>SUF SS1</b>	<b>SUF SS1 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 869,000</b>
SUF SS2	Marcy 345kV Bay 3100 - Reconductor Strain Bus, Replace (3) breakers and wave trap UE1-7- Marcy-Edic Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 2,946,086	\$ 2,947,000
SUF SS2	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 120,720	\$ 121,000
SUF SS2	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 767,000
<b>SUF SS2</b>	<b>SUFSS 2 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 3,835,000</b>
SUF SS3	Edic 345kV Bay - UE1-7- Marcy-Edic Line Replace (2) breakers and wave trap	1	LS					\$ 1,661,294	\$ 1,662,000
SUF SS3	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 93,120	\$ 94,000
SUF SS3	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 439,000
<b>SUF SS3</b>	<b>SUF SS3 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 2,195,000</b>
SUF SS4	Removals	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS4	Removals		LS %					\$ -	\$ -
SUF SS4	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS4</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
SUF SS5	Removals	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS5	Removals		LS %					\$ -	\$ -
SUF SS5	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS5</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>STATIONS SUF DIRECT TOTAL:</b>									<b>\$ 5,519,000</b>
<b>STATIONS SUF INDIRECT TOTAL:</b>									<b>\$ 1,380,000</b>
<b>STATIONS SUF TOTAL</b>									<b>\$ 6,899,000</b>

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**R. Knickerbocker Substation - Install**

Estimate  
Revision: 7

Total: \$ 82,734,279

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>R. Knickerbocker Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 926,950	\$ 10,925,250	\$ 11,852,200
2. SUBSTATION FOUNDATIONS	\$ 3,740,976	\$ 3,864,890	\$ 7,605,866
3. SUBSTATION STRUCTURES	\$ 1,874,050	\$ 1,874,050	\$ 3,748,100
4. MAJOR EQUIPMENT	\$ 12,366,667	\$ 2,400,000	\$ 14,766,667
5. SMALL EQUIPMENT / MATERIALS	\$ 4,105,500	\$ 1,165,500	\$ 5,271,000
6. CONTROL HOUSE / PANELS	\$ 3,114,700	\$ 1,556,200	\$ 4,670,900
7. MISC ITEMS	\$ 7,876,951	\$ 11,375,341	\$ 19,252,292
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,720,463	\$ 12,846,791	\$ 15,567,255
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 36,726,257	\$ 46,008,022	\$ 82,734,279
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 36,726,257	\$ 46,008,022	\$ 82,734,279

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>R. Knickerbocker Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	45	ACRES	\$ -	\$ -	\$ 203,000	\$ 9,135,000	\$ 203,000	\$ 9,135,000
1.2	Station stone within substation fence.	14,600	CY	\$ 27	\$ 394,200	\$ 75	\$ 1,095,000	\$ 102	\$ 1,489,200
1.3	Substation Fence	5,100	LF	\$ 100	\$ 510,000	\$ 100	\$ 510,000	\$ 200	\$ 1,020,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide (From Muitzeskill RD)	650	LF	\$ 35	\$ 22,750	\$ 285	\$ 185,250	\$ 320	\$ 208,000
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 926,950		\$ 10,925,250		\$ 11,852,200
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 765kV</b>									
2.1a	Circuit Breaker Foundations	3	EA.	\$ 22,410	\$ 67,230	\$ 24,000	\$ 72,000	\$ 46,410	\$ 139,230
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA.	\$ 52,290	\$ 209,160	\$ 56,000	\$ 224,000	\$ 108,290	\$ 433,160
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1e	Switch Stand Foundations	36	EA.	\$ 8,964	\$ 322,704	\$ 8,964	\$ 322,704	\$ 17,928	\$ 645,408
2.1f									
2.1g	Bus Support 1ph Foundations (High Bus)	54	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations (Low Bus)	70	EA.	\$ 8,964	\$ 627,480	\$ 8,964	\$ 627,480	\$ 17,928	\$ 1,254,960
2.1j	Instrument Transformer Stand Foundations	15	EA.	\$ 8,964	\$ 134,460	\$ 8,964	\$ 134,460	\$ 17,928	\$ 268,920
2.1k	Arrester Stand Foundations	3	EA.	\$ 8,964	\$ 26,892	\$ 8,964	\$ 26,892	\$ 17,928	\$ 53,784
2.1m	Wave Trap Stand Foundations	1	EA.	\$ 8,964	\$ 8,964	\$ 8,964	\$ 8,964	\$ 17,928	\$ 17,928
2.1n									
2.1p	Misc. Structure Foundations	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 345kV</b>									
2.2a	Circuit Breaker Foundations	4	EA.	\$ 14,940	\$ 59,760	\$ 14,940	\$ 59,760	\$ 29,880	\$ 119,520
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA.	\$ 26,145	\$ 209,160	\$ 26,145	\$ 209,160	\$ 52,290	\$ 418,320
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA.	\$ 26,145	\$ -	\$ 26,145	\$ -	\$ 52,290	\$ -
2.2e	Switch Stand Foundations	48	EA.	\$ 4,482	\$ 215,136	\$ 4,482	\$ 215,136	\$ 8,964	\$ 430,272

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2f	Station Service Transformer Stand Foundation	0	EA.	\$ 4,482	\$ -	\$ 4,482	\$ -	\$ 8,964	\$ -
2.2g	Bus Support 1ph Foundations (High Bus)	27	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations (Low Bus)	51	EA.	\$ 4,482	\$ 228,582	\$ 4,482	\$ 228,582	\$ 8,964	\$ 457,164
2.2j	Instrument Transformer Stand Foundations	24	EA.	\$ 4,482	\$ 107,568	\$ 4,482	\$ 107,568	\$ 8,964	\$ 215,136
2.2k	Arrester Stand Foundations	6	EA.	\$ 4,482	\$ 26,892	\$ 4,482	\$ 26,892	\$ 8,964	\$ 53,784
2.2m	Wave Trap Stand Foundations	2	EA.	\$ 4,482	\$ 8,964	\$ 4,482	\$ 8,964	\$ 8,964	\$ 17,928
2.2n	Misc. Structure Foundations	2	EA.	\$ 8,964	\$ 17,928	\$ 8,964	\$ 17,928	\$ 17,928	\$ 35,856
2.2p									
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	765-345kV Transformer Foundation w/ Oil Containment	7	EA.	\$ 97,110	\$ 679,770	\$ 104,000	\$ 728,000	\$ 201,110	\$ 1,407,770
2.4b	765-345kV Transformer Fire Wall	6	EA.	\$ 106,074	\$ 636,444	\$ 113,600	\$ 681,600	\$ 219,674	\$ 1,318,044
2.4c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 74,700	\$ 74,700	\$ 80,000	\$ 80,000	\$ 154,700	\$ 154,700
2.5b	Generator Foundation	1	EA	\$ 16,434	\$ 16,434	\$ 17,600	\$ 17,600	\$ 34,034	\$ 34,034
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	12	EA	\$ 5,229	\$ 62,748	\$ 5,600	\$ 67,200	\$ 10,829	\$ 129,948
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 3,740,976		\$ 3,864,890		\$ 7,605,866
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>765kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	1	EA.	\$ 111,000	\$ 111,000	\$ 111,000	\$ 111,000	\$ 222,000	\$ 222,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1c	Switch Stands	6	EA.	\$ 22,200	\$ 133,200	\$ 22,200	\$ 133,200	\$ 44,400	\$ 266,400
3.1d									
3.1e	Bus Support 1ph (High Bus)	54	EA.	\$ 7,400	\$ 399,600	\$ 7,400	\$ 399,600	\$ 14,800	\$ 799,200
3.1f	Bus Support 1 Ph (low Bus)	70	EA.	\$ 5,550	\$ 388,500	\$ 5,550	\$ 388,500	\$ 11,100	\$ 777,000
3.1g	Instrument Transformer Stand	15	EA.	\$ 3,700	\$ 55,500	\$ 3,700	\$ 55,500	\$ 7,400	\$ 111,000
3.1h	Arrester Stand	3	EA.	\$ 3,700	\$ 11,100	\$ 3,700	\$ 11,100	\$ 7,400	\$ 22,200
3.1j	Wave Trap Stand	1	EA.	\$ 9,250	\$ 9,250	\$ 9,250	\$ 9,250	\$ 18,500	\$ 18,500
3.1k	Lightning Mast	12	EA.	\$ 9,250	\$ 111,000	\$ 9,250	\$ 111,000	\$ 18,500	\$ 222,000
<b>3.2</b>	<b>345kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	2	EA	\$ 37,000	\$ 74,000	\$ 37,000	\$ 74,000	\$ 74,000	\$ 148,000
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.2c	Switch Stands	8	EA	\$ 14,800	\$ 118,400	\$ 14,800	\$ 118,400	\$ 29,600	\$ 236,800
3.2d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.2e	Bus Support 3ph	27	EA	\$ 5,550	\$ 149,850	\$ 5,550	\$ 149,850	\$ 11,100	\$ 299,700
3.2f	Bus Support 1 Ph	51	EA	\$ 3,700	\$ 188,700	\$ 3,700	\$ 188,700	\$ 7,400	\$ 377,400
3.2g	Instrument Transformer Stand	24	EA	\$ 1,850	\$ 44,400	\$ 1,850	\$ 44,400	\$ 3,700	\$ 88,800
3.2h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.2j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.2k	Misc. Structures	6	EA	\$ 6,475	\$ 38,850	\$ 6,475	\$ 38,850	\$ 12,950	\$ 77,700
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 1,874,050		\$ 1,874,050		\$ 3,748,100
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>765kV</b>								
4.1a	Circuit Breakers	3	EA.	\$ 900,000	\$ 2,700,000	\$ 110,000	\$ 330,000	\$ 1,010,000	\$ 3,030,000
4.1b	Capacitor Banks	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c	765-345kV Transformer (1ph)	7	EA.	\$ 1,266,667	\$ 8,866,667	\$ 250,000	\$ 1,750,000	\$ 1,516,667	\$ 10,616,667
4.1d									
<b>4.2</b>	<b>345kV</b>								
4.2a	Circuit Breakers	4	EA	\$ 200,000	\$ 800,000	\$ 80,000	\$ 320,000	\$ 280,000	\$ 1,120,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 12,366,667		\$ 2,400,000		\$ 14,766,667
<b>5. SMALL EQUIPMENT / MATERIALS</b>									



Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.18	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.19	Strain Bus Insulators - 345kV	36	EA	\$ 2,000	\$ 72,000	\$ 1,050	\$ 37,800	\$ 3,050	\$ 109,800
7.20	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.21	SSVT Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.22	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.23	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.24									
7.25									
7.26									
7.27									
7.28									
7.29									
<b>TOTAL - MISC ITEMS</b>					\$ 7,876,951		\$ 11,375,341		\$ 19,252,292
<b>R. Knickerbocker Substation - Install</b>					\$ 34,005,794		\$ 33,161,231		\$ 67,167,025
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 671,670	\$ 671,670	\$ 671,670	\$ 671,670
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,426,405	\$ 2,426,405	\$ 2,426,405	\$ 2,426,405
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 671,670	\$ 671,670	\$ 671,670	\$ 671,670
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 671,670	\$ 671,670	\$ 671,670	\$ 671,670
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,373,362	\$ 5,373,362	\$ 5,373,362	\$ 5,373,362
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 470,169	\$ 470,169	\$ 470,169	\$ 470,169
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,679,176	\$ 1,679,176	\$ 1,679,176	\$ 1,679,176
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 201,501	\$ 201,501	\$ 201,501	\$ 201,501
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 600,000	\$ 600,000	\$ 600,000	\$ 600,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17	Carrying Charges	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 2,720,463	\$ 2,720,463	\$ -	\$ -	\$ 2,720,463	\$ 2,720,463
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 67,167	\$ 67,167	\$ 67,167	\$ 67,167
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,720,463		\$ 12,846,791		\$ 15,567,255

**NAT & NYPA - T025 - (Segment A, + 765kV)**

**S. Marcy Substation - Install**

Estimate Revision: **7**

Total: \$ **21,526,138**

NAT & NYPA - T025 - (Segment A, + 765kV)			
	Supply	Installation	Total
<b>S. Marcy Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 134,000	\$ 991,250	\$ 1,125,250
2. SUBSTATION FOUNDATIONS	\$ 2,312,712	\$ 2,405,568	\$ 4,718,280
3. SUBSTATION STRUCTURES	\$ 1,283,900	\$ 1,283,900	\$ 2,567,800
4. MAJOR EQUIPMENT	\$ 900,000	\$ 110,000	\$ 1,010,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,361,000	\$ 392,000	\$ 1,753,000
6. CONTROL HOUSE / PANELS	\$ 432,250	\$ 364,750	\$ 797,000
7. MISC ITEMS	\$ 3,112,180	\$ 2,468,996	\$ 5,581,176
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 762,883	\$ 3,210,749	\$ 3,973,633
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 10,298,925</b>	<b>\$ 11,227,213</b>	<b>\$ 21,526,138</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 10,298,925</b>	<b>\$ 11,227,213</b>	<b>\$ 21,526,138</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>S. Marcy Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.8	ACRES	\$ -	\$ -	\$ 203,000	\$ 761,250	\$ 203,000	\$ 761,250
1.2	Station stone within substation fence.	2,000	CY	\$ 27	\$ 54,000	\$ 75	\$ 150,000	\$ 102	\$ 204,000
1.3	Substation Fence	800	LF	\$ 100	\$ 80,000	\$ 100	\$ 80,000	\$ 200	\$ 160,000
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 134,000		\$ 991,250		\$ 1,125,250
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 765kV</b>									
2.1a	Circuit Breaker Foundations	1	EA.	\$ 22,410	\$ 22,410	\$ 24,000	\$ 24,000	\$ 46,410	\$ 46,410
2.1b	Capacitor Bank Foundations	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	24	EA.	\$ 52,290	\$ 1,254,960	\$ 56,000	\$ 1,344,000	\$ 108,290	\$ 2,598,960
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1e	Switch Stand Foundations	18	EA.	\$ 8,964	\$ 161,352	\$ 8,964	\$ 161,352	\$ 17,928	\$ 322,704
2.1f									
2.1g	Bus Support 1ph Foundations (High Bus)	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations (Low Bus)	74	EA.	\$ 8,964	\$ 663,336	\$ 8,964	\$ 663,336	\$ 17,928	\$ 1,326,672
2.1j	Instrument Transformer Stand Foundations	15	EA.	\$ 8,964	\$ 134,460	\$ 8,964	\$ 134,460	\$ 17,928	\$ 268,920
2.1k	Arrester Stand Foundations	3	EA.	\$ 8,964	\$ 26,892	\$ 8,964	\$ 26,892	\$ 17,928	\$ 53,784
2.1m	Wave Trap Stand Foundations	2	EA.	\$ 8,964	\$ 17,928	\$ 8,964	\$ 17,928	\$ 17,928	\$ 35,856
2.1n	Misc. Structure Foundations	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 345kV</b>									
2.2a	Circuit Breaker Foundations	0	EA.	\$ 14,940	\$ -	\$ 14,940	\$ -	\$ 29,880	\$ -
2.2b	Capacitor Bank Foundations	0	EA.	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA.	\$ 26,145	\$ -	\$ 26,145	\$ -	\$ 52,290	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA.	\$ 26,145	\$ -	\$ 26,145	\$ -	\$ 52,290	\$ -
2.2e	Switch Stand Foundations	0	EA.	\$ 4,482	\$ -	\$ 4,482	\$ -	\$ 8,964	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA.	\$ 4,482	\$ -	\$ 4,482	\$ -	\$ 8,964	\$ -
2.2g	Bus Support 1ph Foundations (High Bus)	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations (Low Bus)	0	EA.	\$ 4,482	\$ -	\$ 4,482	\$ -	\$ 8,964	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2j	Instrument Transformer Stand Foundations	0	EA.	\$ 4,482	\$ -	\$ 4,482	\$ -	\$ 8,964	\$ -
2.2k	Arrester Stand Foundations	0	EA.	\$ 4,482	\$ -	\$ 4,482	\$ -	\$ 8,964	\$ -
2.2m	Wave Trap Stand Foundations	0	EA.	\$ 4,482	\$ -	\$ 4,482	\$ -	\$ 8,964	\$ -
2.2n	Misc. Structure Foundations	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	765-345kV Transformer Foundation w/ Oil Containment	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	765-345kV Transformer Fire Wall	0	EA.	\$ 106,074	\$ -	\$ 113,600	\$ -	\$ 219,674	\$ -
2.4c		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	6	EA	\$ 5,229	\$ 31,374	\$ 5,600	\$ 33,600	\$ 10,829	\$ 64,974
2.6b		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 2,312,712		\$ 2,405,568		\$ 4,718,280
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>765kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	6	EA.	\$ 111,000	\$ 666,000	\$ 111,000	\$ 666,000	\$ 222,000	\$ 1,332,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1c	Switch Stands	3	EA.	\$ 22,200	\$ 66,600	\$ 22,200	\$ 66,600	\$ 44,400	\$ 133,200
3.1d									
3.1e	Bus Support 1ph (High Bus)	0	EA.	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1f	Bus Support 1 Ph (low Bus)	74	EA.	\$ 5,550	\$ 410,700	\$ 5,550	\$ 410,700	\$ 11,100	\$ 821,400
3.1g	Instrument Transformer Stand	15	EA.	\$ 3,700	\$ 55,500	\$ 3,700	\$ 55,500	\$ 7,400	\$ 111,000
3.1h	Arrester Stand	3	EA.	\$ 3,700	\$ 11,100	\$ 3,700	\$ 11,100	\$ 7,400	\$ 22,200
3.1j	Wave Trap Stand	2	EA.	\$ 9,250	\$ 18,500	\$ 9,250	\$ 18,500	\$ 18,500	\$ 37,000
3.1k	Lightning Mast	6	EA.	\$ 9,250	\$ 55,500	\$ 9,250	\$ 55,500	\$ 18,500	\$ 111,000
<b>3.2</b>	<b>345kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.2c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.2e	Bus Support 3ph	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 1,283,900		\$ 1,283,900		\$ 2,567,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 765kV</b>									
4.1a	Circuit Breakers	1	EA.	\$ 900,000	\$ 900,000	\$ 110,000	\$ 110,000	\$ 1,010,000	\$ 1,010,000
4.1b	Capacitor Banks	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c	765-345kV Transformer (1ph)	0	EA.	\$ -	\$ -	\$ 250,000	\$ -	\$ 250,000	\$ -
4.1d									
<b>4.2 345kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 200,000	\$ -	\$ 80,000	\$ -	\$ 280,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 900,000		\$ 110,000		\$ 1,010,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 765kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 400,000	\$ 400,000	\$ 50,000	\$ 50,000	\$ 450,000	\$ 450,000
5.1b	Disconnect Switches - 3ph w/ manual operator	2	EA	\$ 350,000	\$ 700,000	\$ 45,000	\$ 90,000	\$ 395,000	\$ 790,000
5.1c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 16,000	\$ 48,000	\$ 29,000	\$ 87,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 12,000	\$ 36,000	\$ 25,000	\$ 75,000
5.1e	CCVT'S	9	EA	\$ 12,000	\$ 108,000	\$ 12,000	\$ 108,000	\$ 24,000	\$ 216,000
5.1f	Arresters	3	EA	\$ 15,000	\$ 45,000	\$ 12,000	\$ 36,000	\$ 27,000	\$ 81,000
5.1g	Wave Traps	2	EA	\$ 15,000	\$ 30,000	\$ 12,000	\$ 24,000	\$ 27,000	\$ 54,000
5.1h									
5.1j									
<b>5.2 345kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,361,000		\$ 392,000		\$ 1,753,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 12,500	\$ 37,500	\$ 47,500	\$ 142,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 327,250	\$ 327,250	\$ 327,250	\$ 327,250	\$ 654,500	\$ 654,500
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 432,250		\$ 364,750		\$ 797,000
<b>7. MISC ITEMS 765kV</b>									
7.1	Conduit & Cable Trench System	1,400	LF	\$ 185.00	\$ 259,000	\$ 231.27	\$ 323,778	\$ 416.27	\$ 582,778
7.2	Rigid Bus, Fittings & Insulators	4,500	LF	\$ 515.95	\$ 2,321,775	\$ 237.10	\$ 1,066,950	\$ 753.05	\$ 3,388,725
7.3	Strain Bus, Connectors & Insulators	3,750	LF	\$ 61.50	\$ 230,625	\$ 78.69	\$ 295,088	\$ 140.19	\$ 525,713
7.4	Grounding System	16,000	LF	\$ 6.93	\$ 110,880	\$ 32.58	\$ 521,280	\$ 39.51	\$ 632,160
7.5	Strain Bus Insulators	0	EA	\$ 4,000	\$ -	\$ 2,100	\$ -	\$ 6,100	\$ -
7.6	Control Conduits from Trench to Equipment	1	LS	\$ 81,900	\$ 81,900	\$ 81,900	\$ 81,900	\$ 163,800	\$ 163,800
7.7	Misc. Materials (Above and Below Ground)	1	LS	\$ 108,000	\$ 108,000	\$ 180,000	\$ 180,000	\$ 288,000	\$ 288,000
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
<b>7. MISC ITEMS 345kV</b>									
7.15	Conduit & Cable Trench System	0	LF	\$ 125.07	\$ -	\$ 170.00	\$ -	\$ 295	\$ -
7.16	Rigid Bus, Fittings & Insulators	0	LF	\$ 125.07	\$ -	\$ 237.10	\$ -	\$ 362	\$ -
7.17	Strain Bus, Connectors & Insulators	0	LF	\$ 61.50	\$ -	\$ 78.69	\$ -	\$ 140	\$ -
7.18	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.19	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.20	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.21	SSVT Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.22	Control Cables	0	LS	\$ 531,300	\$ -	\$ 531,300	\$ -	\$ 1,062,600	\$ -
7.23	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.24	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.25									
7.26									
7.27									
7.28									
7.29									
<b>TOTAL - MISC ITEMS</b>					\$ 3,112,180		\$ 2,468,996		\$ 5,581,176
<b>S. Marcy Substation - Install</b>					\$ 9,536,042		\$ 8,016,464		\$ 17,552,506
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 175,525	\$ 175,525	\$ 175,525	\$ 175,525
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 634,083	\$ 634,083	\$ 634,083	\$ 634,083
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 175,525	\$ 175,525	\$ 175,525	\$ 175,525
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 175,525	\$ 175,525	\$ 175,525	\$ 175,525
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,404,200	\$ 1,404,200	\$ 1,404,200	\$ 1,404,200
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 122,868	\$ 122,868	\$ 122,868	\$ 122,868
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 438,813	\$ 438,813	\$ 438,813	\$ 438,813
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 52,658	\$ 52,658	\$ 52,658	\$ 52,658
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 762,883	\$ 762,883	\$ -	\$ -	\$ 762,883	\$ 762,883
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 17,553	\$ 17,553	\$ 17,553	\$ 17,553
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 762,883		\$ 3,210,749		\$ 3,973,633

<b>NAT &amp; NYPA - T025 - (Segment A, + 765kV)</b>	
<b>ESTIMATE ASSUMPTIONS &amp; CLARIFICATIONS</b>	
1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 3.132% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.

NY Power Authority and North American Transmission (T026)			
Description		Total Amount (In thousand \$)	
Direct Cost	1	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$50,021
	1.2	Foundations	\$23,713
	1.3	Structures	\$60,645
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$35,492
	1.5	Insulators, Fitting and Hardwares	\$11,907
	Subtotal (1)		<b>\$181,777</b>
	2	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,340
	2.2	Edic Substation	\$2,153
	2.3	Princetown Substation	\$0
	2.4	New Scotland Substation	\$5,264
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,301	
Subtotal (2)		<b>\$64,603</b>	
Total (1+2)		\$246,381	
Contractors Mark-up (15% of Total 1+2)		\$36,957	
Total Direct Cost (A)		<b>\$283,338</b>	
Indirect Cost	3	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,464
	3.2	Project Management, Material Handling & Amenities	\$18,148
	3.3	Engineering	\$16,643
	3.4	Testing & Commissioning	\$1,523
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$19,753
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,920
Total Indirect Cost (3)		<b>\$75,369</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$358,707</b>	
	4	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	NUF proposed as element of the Project (Marcy and Edic Terminals)	\$7,727
	4.2	NUF identified during Evaluation	\$0
Subtotal NUF Cost (C)		<b>\$7,727</b>	
Total Project Cost (B+C) 2017 \$		<b>\$366,434</b>	
Total Project Cost 2018 \$		<b>\$377,427</b>	

**NAT & NYPA - T026 - (Segment A, Base)**

Estimate Revision: 7

<b>NAT &amp; NYPA - T026 - (Segment A, Base) - Direct Costs</b>		<b>Total Each Segment</b>
Direct Labor, Material & Equipment Costs	A. Transmission Line Edic to Princetown	\$ 122,946,653
Direct Labor, Material & Equipment Costs	B. Transmission Line Princetown to Rotterdam	\$ 20,488,282
Direct Labor, Material & Equipment Costs	C. Transmission Line Princetown to New Scotland	\$ 38,342,499
Direct Labor, Material & Equipment Costs	D. Rotterdam Substation - Install	\$ 44,728,474
Direct Labor, Material & Equipment Costs	E. Rotterdam Substation - Removal	\$ 3,611,030
Direct Labor, Material & Equipment Costs	F. Edic Substation - Install	\$ 2,117,185
Direct Labor, Material & Equipment Costs	G. Edic Substation - Removal	\$ 35,750
Direct Labor, Material & Equipment Costs	H. New Scotland Substation - Install	\$ 5,182,753
Direct Labor, Material & Equipment Costs	I. New Scotland Substation - Removal	\$ 81,300
Direct Labor, Material & Equipment Costs	J. Porter Substation - Install	\$ 71,912
Direct Labor, Material & Equipment Costs	K. Porter Substation - Removal	\$ 474,313
Direct Labor, Material & Equipment Costs	L. Interconnection Edic Station	\$ 1,784,075
Direct Labor, Material & Equipment Costs	M. Interconnection New Scotland Station	\$ 2,594,271
Direct Labor, Material & Equipment Costs	N. Interconnection Rotterdam Station	\$ 3,922,412
Direct Labor, Material & Equipment Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Direct Labor, Material & Equipment Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 5,519,000
<b>SUBTOTAL:</b>		\$ 251,899,910
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		\$ 37,784,986
<b>CONTINGENCY ON ENTIRE PROJECT</b>		\$ -
<b>TOTAL DIRECT:</b>		\$ 289,684,896

<b>NAT &amp; NYPA - T026 - (Segment A, Base) - Indirect Costs</b>		<b>Total Each Segment</b>
Indirect Costs	A. Transmission Line Edic to Princetown	\$ 38,230,749
Indirect Costs	B. Transmission Line Princetown to Rotterdam	\$ 4,591,422
Indirect Costs	C. Transmission Line Princetown to New Scotland	\$ 9,378,594
Indirect Costs	D. Rotterdam Substation - Install	\$ 11,157,029
Indirect Costs	E. Rotterdam Substation - Removal	\$ 605,422
Indirect Costs	F. Edic Substation - Install	\$ 527,893
Indirect Costs	G. Edic Substation - Removal	\$ 5,958
Indirect Costs	H. New Scotland Substation - Install	\$ 1,274,027
Indirect Costs	I. New Scotland Substation - Removal	\$ 13,549
Indirect Costs	J. Porter Substation - Install	\$ 15,559
Indirect Costs	K. Porter Substation - Removal	\$ 79,048
Indirect Costs	L. Interconnection Edic Station	\$ 347,969
Indirect Costs	M. Interconnection New Scotland Station	\$ 521,432
Indirect Costs	N. Interconnection Rotterdam Station	\$ 700,321
Indirect Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Indirect Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 1,380,000
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lisc. & Permit., and Envir. Mitagation)	\$ 7,919,694
<b>TOTAL INDIRECT:</b>		\$ 76,748,667

**TOTAL ESTIMATED COST: \$ 366,433,564**

**NAT & NYPA - T026 - (Segment A, Base)**

**A. Transmission Line Edic to Princetown**

Estimate Revision: **7** Total: \$ **161,177,402**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>A. Transmission Line Edic to Princetown</b>			
1. CLEARING & ACCESS	\$ 41,500	\$ 35,680,876	\$ 35,722,376
2. FOUNDATIONS	\$ 3,098,282	\$ 10,723,946	\$ 13,822,229
3. STRUCTURES	\$ 14,839,646	\$ 25,190,231	\$ 40,029,876
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 4,932,087	\$ 20,895,790	\$ 25,827,877
5. INSULATORS, FITTINGS, HARDWARE	\$ 5,125,311	\$ 2,418,984	\$ 7,544,295
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,242,946	\$ 35,987,803	\$ 38,230,749
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 30,279,773</b>	<b>\$ 130,897,630</b>	<b>\$ 161,177,402</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 30,279,773</b>	<b>\$ 130,897,630</b>	<b>\$ 161,177,402</b>

0.0%

0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Edic to Princetown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	8.0	Acre	\$ -	\$ -	\$ 15,000	\$ 120,000	\$ 15,000	\$ 120,000
1.2	Clearing the ROW - Light (mowing)	194.0	Acre	\$ -	\$ -	\$ 5,000	\$ 970,000	\$ 5,000	\$ 970,000
1.3	Access Road	70,540.8	LF	\$ -	\$ -	\$ 45	\$ 3,174,336	\$ 45	\$ 3,174,336
1.4	Silt Fence	352,704.0	LF	\$ -	\$ -	\$ 4	\$ 1,410,816	\$ 4	\$ 1,410,816
1.5	Matting - Access and ROW	282,163.2	LF	\$ -	\$ -	\$ 70	\$ 19,751,424	\$ 70	\$ 19,751,424
1.6	Matting - To Work Area	25,200.0	LF	\$ -	\$ -	\$ 70	\$ 1,764,000	\$ 70	\$ 1,764,000
1.7	Snow Removal	66.8	Mile	\$ -	\$ -	\$ 16,000	\$ 1,068,800	\$ 16,000	\$ 1,068,800
1.8	ROW Restoration	66.8	Mile	\$ -	\$ -	\$ 10,000	\$ 668,000	\$ 10,000	\$ 668,000
1.9	Work Pads	1,680,000.0	SF	\$ -	\$ -	\$ 4	\$ 5,913,600	\$ 4	\$ 5,913,600
1.10	Restoration for Work Pad areas	336,000.0	SF	\$ -	\$ -	\$ 0.15	\$ 50,400	\$ 0	\$ 50,400
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	50	EA	\$ -	\$ -	\$ 4,580	\$ 229,000	\$ 4,580	\$ 229,000
1.14	Maintenance and Protection of Traffic on Public Roads	100	EA	\$ -	\$ -	\$ 4,130	\$ 413,000	\$ 4,130	\$ 413,000
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	17	EA	\$ 2,000	\$ 34,000	\$ 2,500	\$ 42,500	\$ 4,500	\$ 76,500
1.17	Concrete Washout Station	50	EA	\$ -	\$ -	\$ 1,850	\$ 92,500	\$ 1,850	\$ 92,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 41,500	\$ 35,680,876	\$ 35,722,376	\$	\$ 35,722,376
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 4' x 16'	416	EA	\$ 941	\$ 391,345	\$ 7,398	\$ 3,077,513	\$ 8,339	\$ 3,468,858
2.2	Direct Embed Foundations - 4' x 17'	2	EA	\$ 995	\$ 1,990	\$ 7,833	\$ 15,666	\$ 8,828	\$ 17,656
2.3	Direct Embed Foundations - 4' x 19'	52	EA	\$ 1,104	\$ 57,408	\$ 8,703	\$ 452,576	\$ 9,807	\$ 509,979
2.4	Direct Embed Foundations - 4' x 21'	4	EA	\$ 1,213	\$ 4,851	\$ 9,574	\$ 38,295	\$ 10,786	\$ 43,146
2.5	Direct Embed Foundations - 4' x 23'	16	EA	\$ 1,322	\$ 21,144	\$ 10,444	\$ 167,105	\$ 11,766	\$ 188,249
2.6	Direct Embed Foundations - 4' x 25'	4	EA	\$ 1,430	\$ 5,721	\$ 11,314	\$ 45,258	\$ 12,745	\$ 50,979
2.7	Direct Embed Foundations - 6' x 18'	6	EA	\$ 1,857	\$ 11,145	\$ 18,603	\$ 111,621	\$ 20,461	\$ 122,766
2.8	Direct Embed Foundations - 6' x 19'	6	EA	\$ 1,952	\$ 11,711	\$ 19,583	\$ 117,496	\$ 21,534	\$ 129,207
2.9	Direct Embed Foundations - 6' x 20'	14	EA	\$ 2,046	\$ 28,648	\$ 20,562	\$ 287,864	\$ 22,608	\$ 316,512
2.10	Direct Embed Foundations - 6' x 21'	15	EA	\$ 2,141	\$ 32,110	\$ 21,541	\$ 323,113	\$ 23,681	\$ 355,222
2.11	Direct Embed Foundations - 6' x 22'	7	EA	\$ 2,235	\$ 15,645	\$ 22,520	\$ 157,640	\$ 24,755	\$ 173,285
2.12	Direct Embed Foundations - 6' x 25'	6	EA	\$ 2,518	\$ 15,109	\$ 25,457	\$ 152,744	\$ 27,976	\$ 167,854
2.13	Direct Embed Foundations - 6' x 26'	1	EA	\$ 2,613	\$ 2,613	\$ 26,437	\$ 26,437	\$ 29,049	\$ 29,049
2.14	Direct Embed Foundations - 6' x 28'	3	EA	\$ 2,707	\$ 8,121	\$ 27,416	\$ 82,247	\$ 30,123	\$ 90,368
2.15	Direct Embed Foundations - 6' x 29'	3	EA	\$ 2,896	\$ 8,687	\$ 29,374	\$ 88,122	\$ 32,270	\$ 96,809
2.16	Direct Embed Foundations - 6' x 33'	3	EA	\$ 3,273	\$ 9,820	\$ 33,290	\$ 99,871	\$ 36,564	\$ 109,691
2.17	Direct Embed Foundations - 7' x 27'	2	EA	\$ 3,337	\$ 6,673	\$ 37,316	\$ 74,631	\$ 40,652	\$ 81,305
2.18	Direct Embed Foundations - 7' x 28'	1	EA	\$ 3,452	\$ 3,452	\$ 38,648	\$ 38,648	\$ 42,101	\$ 42,101
2.19	Direct Embed Foundations - 7' x 49'	1	EA	\$ 5,880	\$ 5,880	\$ 66,635	\$ 66,635	\$ 72,515	\$ 72,515

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.20	Direct Embed Foundations - 7' x 61'	1	EA	\$ 7,267	\$ 7,267	\$ 82,628	\$ 82,628	\$ 89,894	\$ 89,894
2.21	Drilled Pier - 6' x 20'	54	EA	\$ 18,064	\$ 975,459	\$ 18,261	\$ 986,079	\$ 36,325	\$ 1,961,539
2.22	Drilled Pier - 7' x 19'	15	EA	\$ 23,416	\$ 351,246	\$ 23,671	\$ 355,070	\$ 47,088	\$ 706,315
2.23	Drilled Pier - 7' x 21'	12	EA	\$ 25,758	\$ 309,096	\$ 26,038	\$ 312,461	\$ 51,796	\$ 621,558
2.24	Drilled Pier - 7' x 22'	6	EA	\$ 26,929	\$ 161,573	\$ 27,222	\$ 163,332	\$ 54,151	\$ 324,905
2.26	Drilled Pier - 7' x 23'	3	EA	\$ 28,100	\$ 84,299	\$ 28,406	\$ 85,217	\$ 56,505	\$ 169,516
2.27	Drilled Pier - 7' x 33'	6	EA	\$ 39,808	\$ 238,847	\$ 40,241	\$ 241,447	\$ 80,049	\$ 480,295
2.28	Drilled Pier - 7' x 42'	3	EA	\$ 50,345	\$ 151,036	\$ 50,893	\$ 152,680	\$ 101,239	\$ 303,716
2.29	Drilled Pier - 8' x 27'	2	EA	\$ 42,819	\$ 85,637	\$ 57,340	\$ 114,680	\$ 100,158	\$ 200,317
2.30	Drilled Pier - 8' x 29'	2	EA	\$ 45,877	\$ 91,754	\$ 61,436	\$ 122,871	\$ 107,313	\$ 214,625
2.31	Rock Excavation Adder	1,342	CY	\$ -	\$ -	\$ 2,000	\$ 2,684,000	\$ 2,000	\$ 2,684,000
<b>TOTAL - FOUNDATIONS:</b>					\$ 3,098,282		\$ 10,723,946		\$ 13,822,229
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 50,024	\$ 350,168	\$ 30,014	\$ 210,101	\$ 80,038	\$ 560,269
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 120'	4	Structure	\$ 52,207	\$ 208,828	\$ 31,324	\$ 125,297	\$ 83,531	\$ 334,125
3.3	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 130'	3	Structure	\$ 58,257	\$ 174,770	\$ 34,954	\$ 104,862	\$ 93,210	\$ 279,631
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 135'	10	Structure	\$ 60,884	\$ 608,835	\$ 36,530	\$ 365,301	\$ 97,414	\$ 974,136
3.5	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 145'	1	Structure	\$ 64,473	\$ 64,473	\$ 38,684	\$ 38,684	\$ 103,156	\$ 103,156
3.6	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 115'	1	Structure	\$ 72,039	\$ 72,039	\$ 43,223	\$ 43,223	\$ 115,262	\$ 115,262
3.7	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 130'	3	Structure	\$ 85,082	\$ 255,245	\$ 51,049	\$ 153,147	\$ 136,130	\$ 408,391
3.8	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 135'	1	Structure	\$ 92,278	\$ 92,278	\$ 55,367	\$ 55,367	\$ 147,645	\$ 147,645
3.9	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.10	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 120'	1	Structure	\$ 127,558	\$ 127,558	\$ 76,535	\$ 76,535	\$ 204,092	\$ 204,092
3.11	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 150'	1	Structure	\$ 208,033	\$ 208,033	\$ 124,820	\$ 124,820	\$ 332,852	\$ 332,852
3.12	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 160'	1	Structure	\$ 238,595	\$ 238,595	\$ 143,157	\$ 143,157	\$ 381,751	\$ 381,751
3.13	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 75'	1	Structure	\$ 24,476	\$ 24,476	\$ 14,685	\$ 14,685	\$ 39,161	\$ 39,161
3.14	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 80'	2	Structure	\$ 25,826	\$ 51,652	\$ 15,496	\$ 30,991	\$ 41,322	\$ 82,643
3.15	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 84'	169	Structure	\$ 29,526	\$ 4,989,894	\$ 17,716	\$ 2,993,936	\$ 47,242	\$ 7,983,830
3.16	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 89'	36	Structure	\$ 32,708	\$ 1,177,488	\$ 19,625	\$ 706,493	\$ 52,333	\$ 1,883,981
3.17	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 93'	23	Structure	\$ 34,540	\$ 794,409	\$ 20,724	\$ 476,645	\$ 55,263	\$ 1,271,054
3.18	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 98'	10	Structure	\$ 37,500	\$ 374,995	\$ 22,500	\$ 224,997	\$ 59,999	\$ 599,992
3.19	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 102'	4	Structure	\$ 43,901	\$ 175,602	\$ 26,340	\$ 105,361	\$ 70,241	\$ 280,963
3.20	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 107'	2	Structure	\$ 45,936	\$ 91,871	\$ 27,561	\$ 55,123	\$ 73,497	\$ 146,994
3.21	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 80'	2	Structure	\$ 55,241	\$ 110,482	\$ 33,145	\$ 66,289	\$ 88,386	\$ 176,771
3.22	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 85'	19	Structure	\$ 57,813	\$ 1,098,438	\$ 34,688	\$ 659,063	\$ 92,500	\$ 1,757,500
3.23	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 90'	2	Structure	\$ 61,050	\$ 122,100	\$ 36,630	\$ 73,260	\$ 97,680	\$ 195,360
3.24	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 95'	2	Structure	\$ 65,120	\$ 130,240	\$ 39,072	\$ 78,144	\$ 104,192	\$ 208,384
3.25	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 100'	1	Structure	\$ 68,635	\$ 68,635	\$ 41,181	\$ 41,181	\$ 109,816	\$ 109,816
3.26	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 105'	1	Structure	\$ 72,872	\$ 72,872	\$ 43,723	\$ 43,723	\$ 116,594	\$ 116,594
3.27	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 75'	2	Structure	\$ 61,513	\$ 123,025	\$ 36,908	\$ 73,815	\$ 98,420	\$ 196,840
3.28	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 80'	3	Structure	\$ 69,079	\$ 207,237	\$ 41,447	\$ 124,342	\$ 110,526	\$ 331,579
3.29	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 85'	4	Structure	\$ 75,739	\$ 302,956	\$ 45,443	\$ 181,774	\$ 121,182	\$ 484,730
3.30	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 90'	4	Structure	\$ 81,493	\$ 325,970	\$ 48,896	\$ 195,582	\$ 130,388	\$ 521,552
3.31	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 80'	1	Structure	\$ 97,403	\$ 97,403	\$ 58,442	\$ 58,442	\$ 155,844	\$ 155,844
3.32	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 85'	6	Structure	\$ 105,802	\$ 634,809	\$ 63,481	\$ 380,885	\$ 169,282	\$ 1,015,694
3.33	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 90'	6	Structure	\$ 117,253	\$ 703,518	\$ 70,352	\$ 422,111	\$ 187,605	\$ 1,125,629
3.34	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 95'	1	Structure	\$ 129,408	\$ 129,408	\$ 77,645	\$ 77,645	\$ 207,052	\$ 207,052
3.35	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 178,026	\$ 178,026	\$ 106,815	\$ 106,815	\$ 284,841	\$ 284,841
3.36	Remove Existing Foundation	50	EA	\$ -	\$ -	\$ 7,500	\$ 375,000	\$ 7,500	\$ 375,000
3.37	Remove Existing Structure and Accessories	994	EA	\$ -	\$ -	\$ 12,500	\$ 12,425,000	\$ 12,500	\$ 12,425,000
3.38	Install Grounding and Grounding Accessories	666	Pole	\$ 506	\$ 336,996	\$ 5,539	\$ 3,688,641	\$ 6,045	\$ 4,025,637
<b>TOTAL - STRUCTURES:</b>					\$ 14,839,646		\$ 25,190,231		\$ 40,029,876
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal" (Edic to 12.6 Miles)	2,228,688	LF	\$ 1.90	\$ 4,234,507	\$ 5.00	\$ 11,143,440	\$ 6.90	\$ 15,377,947

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
4.2	(1) OPGW 36 Fiber AC-33/38/571 (Edic to 12.6 Miles)	301,594	LF	\$ 1.35	\$ 407,152	\$ 5.00	\$ 1,507,970	\$ 6.35	\$ 1,915,122
4.3	(1) 3/8" EHS7 Steel (Edic to 12.6 Miles)	271,656	LF	\$ 0.47	\$ 127,678	\$ 5.00	\$ 1,358,280	\$ 5.47	\$ 1,485,958
4.4									
4.5									
4.6									
4.7	Remove Existing Conductor and Accessories	121.0	Mile	\$ -	\$ -	\$ 30,000	\$ 3,630,000	\$ 30,000.00	\$ 3,630,000
4.8	Remove Existing OPGW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.9	Remove Existing OHSW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.10									
4.11									
4.12									
4.13	Rider Poles (187 Locations)	93	Set	\$ 1,750	\$ 162,750	\$ 3,500	\$ 325,500	\$ 5,250.00	\$ 488,250
4.14	Rider Poles - Relocated	94	Set	\$ -	\$ -	\$ 3,500	\$ 329,000	\$ 3,500.00	\$ 329,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 4,932,087		\$ 20,895,790		\$ 25,827,877
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,276	Assembly	\$ 1,800	\$ 2,296,800	\$ 720	\$ 918,720	\$ 2,520	\$ 3,215,520
5.2	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.3			Assembly		\$ -		\$ -	\$ -	\$ -
5.4	OPGW Assembly - Tangent	304	Assembly	\$ 200	\$ 60,800	\$ 150	\$ 45,600	\$ 350	\$ 106,400
5.5	OPGW Assembly - Angle / DE	64	Assembly	\$ 250	\$ 16,000	\$ 150	\$ 9,600	\$ 400	\$ 25,600
5.6	OHSW Assembly - Tangent	274	Assembly	\$ 200	\$ 54,800	\$ 150	\$ 41,100	\$ 350	\$ 95,900
5.7	OHSW Assembly - Angle / DE	56	Assembly	\$ 250	\$ 14,000	\$ 150	\$ 8,400	\$ 400	\$ 22,400
5.8	OPGW Splice Boxes	27	Assembly	\$ 1,746	\$ 47,146	\$ 2,274	\$ 61,398	\$ 4,020	\$ 108,544
5.9	OPGW Splice & Test	27	EA	\$ 2,520	\$ 68,040	\$ 2,520	\$ 68,040	\$ 5,040	\$ 136,080
5.10	Spacer - Conductor	5,244	EA	\$ 50	\$ 262,200	\$ 35	\$ 183,540	\$ 85	\$ 445,740
5.11	Vibration Dampers - Conductor	4,164	EA	\$ 35	\$ 145,740	\$ 35	\$ 145,740	\$ 70	\$ 291,480
5.12	Shield wire / OPGW Dampers, Misc. Fittings	1,087	EA	\$ 27	\$ 29,349	\$ 35	\$ 38,045	\$ 62	\$ 67,394
5.13	Replace - Mono Pole Vertical Tangent (1-Group of 18-Bells Each Assembly)	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.14	Replace - Dead-end & Angle Insulators (1, Group of 18-Bells Each Assembly)	195	Assembly	\$ 1,800	\$ 351,000	\$ 720	\$ 140,400	\$ 2,520	\$ 491,400
5.15	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.16	Misc. materials (Signs and Markers)	66.8	Mile	\$ 770	\$ 51,436	\$ 1,006	\$ 67,201	\$ 1,776	\$ 118,637
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 5,125,311		\$ 2,418,984		\$ 7,544,295
<b>A. Transmission Line Edic to Princetown</b>					\$ 28,036,826		\$ 94,909,827		\$ 122,946,653
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 6,597,194	\$ 6,597,194	\$ 6,597,194	\$ 6,597,194
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467	\$ 1,229,467
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 6,147,333	\$ 6,147,333	\$ 6,147,333	\$ 6,147,333
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 368,840	\$ 368,840	\$ 368,840	\$ 368,840
6.7	Geotech	67	Location	\$ -	\$ -	\$ 3,500	\$ 234,500	\$ 3,500	\$ 234,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 860,627	\$ 860,627	\$ 860,627	\$ 860,627
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 368,840	\$ 368,840	\$ 368,840	\$ 368,840
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 8,640,000	\$ 8,640,000	\$ 8,640,000	\$ 8,640,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Compensation for use of 1 Ckt - NYPA Structures (92 Structures)	1	LS	\$ -	\$ -	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123
6.18	Sales Tax on Materials	1	LS	\$ 2,242,946	\$ 2,242,946	\$ -	\$ -	\$ 2,242,946	\$ 2,242,946
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 122,947	\$ 122,947	\$ 122,947	\$ 122,947
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,242,946		\$ 35,987,803		\$ 38,230,749

**NAT & NYPA - T026 - (Segment A, Base)**

**B. Transmission Line Princetown to Rotterdam**

Estimate Revision: **7** Total: \$ **25,079,704**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>B. Transmission Line Princetown to Rotterdam</b>			
1. CLEARING & ACCESS	\$ 6,000	\$ 3,038,200	\$ 3,044,200
2. FOUNDATIONS	\$ 417,002	\$ 3,778,708	\$ 4,195,711
3. STRUCTURES	\$ 3,876,135	\$ 4,280,943	\$ 8,157,078
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 722,365	\$ 2,620,705	\$ 3,343,070
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,199,031	\$ 549,192	\$ 1,748,223
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 497,643	\$ 4,093,779	\$ 4,591,422
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>6,718,177</b>	\$ <b>18,361,527</b>	\$ <b>25,079,704</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>6,718,177</b>	\$ <b>18,361,527</b>	\$ <b>25,079,704</b>

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**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Princetown to Rotterdam</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	24.0	Acre	\$ -	\$ -	\$ 5,000	\$ 120,000	\$ 5,000	\$ 120,000
1.3	Access Road	5,280	LF	\$ -	\$ -	\$ 45	\$ 237,600	\$ 45	\$ 237,600
1.4	Silt Fence	26,400	LF	\$ -	\$ -	\$ 4	\$ 105,600	\$ 4	\$ 105,600
1.5	Matting - Access and ROW	21,120	LF	\$ -	\$ -	\$ 70	\$ 1,478,400	\$ 70	\$ 1,478,400
1.6	Matting - To Work Area	2,775	LF	\$ -	\$ -	\$ 70	\$ 194,250	\$ 70	\$ 194,250
1.7	Snow Removal	5	Mile	\$ -	\$ -	\$ 16,000	\$ 80,000	\$ 16,000	\$ 80,000
1.8	ROW Restoration	5	Mile	\$ -	\$ -	\$ 10,000	\$ 50,000	\$ 10,000	\$ 50,000
1.9	Work Pads	185,000	SF	\$ -	\$ -	\$ 4	\$ 651,200	\$ 4	\$ 651,200
1.10	Restoration for Work Pad areas	37,000	SF	\$ -	\$ -	\$ 0.2	\$ 5,550	\$ 0	\$ 5,550
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	10	EA	\$ -	\$ -	\$ 4,580	\$ 45,800	\$ 4,580	\$ 45,800
1.14	Maintenance and Protection of Traffic on Public Roads	10	EA	\$ -	\$ -	\$ 4,130	\$ 41,300	\$ 4,130	\$ 41,300
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 6,000		\$ 3,038,200		\$ 3,044,200
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 6' x 18'	56	EA	\$ 1,857	\$ 104,018	\$ 18,603	\$ 1,041,794	\$ 20,461	\$ 1,145,812
2.2	Direct Embed Foundations - 6' x 20'	4	EA	\$ 2,046	\$ 8,185	\$ 20,562	\$ 82,247	\$ 22,608	\$ 90,432
2.3	Direct Embed Foundations - 6' x 22'	8	EA	\$ 2,235	\$ 17,880	\$ 22,520	\$ 180,160	\$ 24,755	\$ 198,040
2.4	Direct Embed Foundations - 7' x 25'	4	EA	\$ 3,105	\$ 12,422	\$ 34,650	\$ 138,601	\$ 37,756	\$ 151,023
2.5	Drilled Pier - 6' x 19'	6	EA	\$ 17,204	\$ 103,223	\$ 17,391	\$ 104,347	\$ 34,595	\$ 207,570
2.6	Drilled Pier - 8' x 27'	4	EA	\$ 42,819	\$ 171,274	\$ 57,340	\$ 229,359	\$ 100,158	\$ 400,633
2.7	Rock Excavation Adder	1,001.1	CY	\$ -	\$ -	\$ 2,000	\$ 2,002,200	\$ 2,000	\$ 2,002,200
<b>TOTAL - FOUNDATIONS:</b>					\$ 417,002		\$ 3,778,708		\$ 4,195,711
<b>3. STRUCTURES</b>									
3.1	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 115'	24	Structure	\$ 85,544	\$ 2,053,056	\$ 51,326	\$ 1,231,834	\$ 136,870	\$ 3,284,890
3.2	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 135'	2	Structure	\$ 106,005	\$ 212,010	\$ 63,603	\$ 127,206	\$ 169,608	\$ 339,216
3.3	2x 1-CKT 345KV DELTA SMALL ANGLE (1°-15°) - 115'	2	Structure	\$ 141,673	\$ 283,346	\$ 85,004	\$ 170,008	\$ 226,677	\$ 453,354
3.4	2x 1-CKT 345KV VERTICAL TANGENT DEADEND (0°-5°) - 115'	4	Structure	\$ 109,816	\$ 439,264	\$ 65,890	\$ 263,558	\$ 175,706	\$ 702,822
3.5	2x 1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	2	Structure	\$ 232,656	\$ 465,312	\$ 139,594	\$ 279,187	\$ 372,250	\$ 744,499
3.6	2x 1-CKT 345KV 3-POLE LARGE ANGLE DEADEND (60°-90°) - 115'	1	Structure	\$ 176,342	\$ 176,342	\$ 105,805	\$ 105,805	\$ 282,147	\$ 282,147
3.7	2x 1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 65'	1	Structure	\$ 99,493	\$ 99,493	\$ 59,696	\$ 59,696	\$ 159,189	\$ 159,189
3.8	2x 1-CKT 345KV DELTA TANGENT (0°-1°) HD - 115'	1	Structure	\$ 105,820	\$ 105,820	\$ 63,492	\$ 63,492	\$ 169,312	\$ 169,312

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.9	Remove Existing Foundation	22	EA	\$ -	\$ -	\$ 7,500	\$ 163,500	\$ 7,500	\$ 163,500
3.10	Remove Existing Structure and Accessories	109	EA	\$ -	\$ -	\$ 12,500	\$ 1,362,500	\$ 12,500	\$ 1,362,500
3.11	Install Grounding and Grounding Accessories	82	Pole	\$ 506	\$ 41,492	\$ 5,539	\$ 454,157	\$ 6,045	\$ 495,649
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 3,876,135		\$ 4,280,943		\$ 8,157,078
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal" (R1 - R36)	339,293	LF	\$ 1.90	\$ 644,657	\$ 5.00	\$ 1,696,465	\$ 6.90	\$ 2,341,122
4.2	(1) OPGW 36 Fiber AC-33/38/571 (R1 - R36)	28,274	LF	\$ 1.35	\$ 38,170	\$ 5.00	\$ 141,370	\$ 6.35	\$ 179,540
4.3	(1) 3/8" EHS7 Steel (R1 - R36)	28,274	LF	\$ 0.47	\$ 13,289	\$ 5.00	\$ 141,370	\$ 5.47	\$ 154,659
4.5	Remove Existing Conductor and Accessories	10.0	Mile	\$ -	\$ -	\$ 30,000	\$ 300,000	\$ 30,000.00	\$ 300,000
4.6	Remove Existing OPGW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.7	Remove Existing OHSW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.8	Rider Poles	15	EA	\$ 1,750	\$ 26,250	\$ 3,500	\$ 52,500	\$ 5,250.00	\$ 78,750
4.9	Rider Poles - Relocated	14	Set	\$ -	\$ -	\$ 3,500	\$ 49,000	\$ 3,500.00	\$ 49,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 722,365		\$ 2,620,705		\$ 3,343,070
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	348	Assembly	\$ 1,800	\$ 626,400	\$ 720	\$ 250,560	\$ 2,520	\$ 876,960
5.2	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	240	Assembly	\$ 1,800	\$ 432,000	\$ 720	\$ 172,800	\$ 2,520	\$ 604,800
5.3	OPGW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.4	OPGW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.5	OHSW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.6	OHSW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.7	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,968	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.8	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.9	Spacer - Conductor	1,002	EA	\$ 50	\$ 50,100	\$ 35	\$ 35,070	\$ 85	\$ 85,170
5.10	Vibration Dampers - Conductor	852	EA	\$ 35	\$ 29,820	\$ 35	\$ 29,820	\$ 70	\$ 59,640
5.11	Shieldwire / OPGW Dampers, Misc. Fittings	116	EA	\$ 27	\$ 3,132	\$ 35	\$ 4,060	\$ 62	\$ 7,192
5.12	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.13	Misc. materials (Signs and Markers)	5.0	Mile	\$ 770	\$ 3,850	\$ 1,006	\$ 5,030	\$ 1,776	\$ 8,880
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,199,031		\$ 549,192		\$ 1,748,223
<b>B. Transmission Line Princetown to Rotterdam</b>					\$ 6,220,534		\$ 14,267,748		\$ 20,488,282
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,099,381	\$ 1,099,381	\$ 1,099,381	\$ 1,099,381
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.7	Geotech	5	Location	\$ -	\$ -	\$ 3,500	\$ 17,500	\$ 3,500	\$ 17,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 143,418	\$ 143,418	\$ 143,418	\$ 143,418
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 497,643	\$ 497,643	\$ -	\$ -	\$ 497,643	\$ 497,643

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 20,488	\$ 20,488	\$ 20,488	\$ 20,488
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 497,643		\$ 4,093,779		\$ 4,591,422

**NAT & NYPA - T026 - (Segment A, Base)**

**C. Transmission Line Princetown to New Scotland**

Estimate  
Revision: 7

Total: \$ 47,721,093

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>C. Transmission Line Princetown to New Scotland</b>			
1. CLEARING & ACCESS	\$ 31,000	\$ 11,223,694	\$ 11,254,694
2. FOUNDATIONS	\$ 1,194,705	\$ 4,499,949	\$ 5,694,653
3. STRUCTURES	\$ 6,879,617	\$ 5,578,039	\$ 12,457,656
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 1,564,842	\$ 4,756,290	\$ 6,321,132
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,767,073	\$ 847,291	\$ 2,614,365
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 914,979	\$ 8,463,615	\$ 9,378,594
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 12,352,215</b>	<b>\$ 35,368,878</b>	<b>\$ 47,721,093</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 12,352,215</b>	<b>\$ 35,368,878</b>	<b>\$ 47,721,093</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	26.0	Acre	\$ -	\$ -	\$ 15,000	\$ 390,000	\$ 15,000	\$ 390,000
1.2	Clearing the ROW - Light (mowing)	57.0	Acre	\$ -	\$ -	\$ 5,000	\$ 285,000	\$ 5,000	\$ 285,000
1.3	Access Road	20,803.2	LF	\$ -	\$ -	\$ 45	\$ 936,144	\$ 45	\$ 936,144
1.4	Silt Fence	104,016.0	LF	\$ -	\$ -	\$ 4	\$ 416,064	\$ 4	\$ 416,064
1.5	Matting - Access and ROW	83,212.8	LF	\$ -	\$ -	\$ 70	\$ 5,824,896	\$ 70	\$ 5,824,896
1.6	Matting - To Work Area	3,375.0	LF	\$ -	\$ -	\$ 70	\$ 236,250	\$ 70	\$ 236,250
1.7	Snow Removal	19.7	Mile	\$ -	\$ -	\$ 16,000	\$ 315,200	\$ 16,000	\$ 315,200
1.8	ROW Restoration	19.7	Mile	\$ -	\$ -	\$ 10,000	\$ 197,000	\$ 10,000	\$ 197,000
1.9	Work Pads	645,000.0	SF	\$ -	\$ -	\$ 4	\$ 2,270,400	\$ 4	\$ 2,270,400
1.10	Restoration for Work Pad areas	129,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 19,350	\$ 0	\$ 19,350
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	2	EA	\$ -	\$ -	\$ 14,445	\$ 28,890	\$ 14,445	\$ 28,890
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	50	EA	\$ -	\$ -	\$ 4,130	\$ 206,500	\$ 4,130	\$ 206,500
1.15	Gates	11	EA	\$ 2,000	\$ 22,000	\$ 2,500	\$ 27,500	\$ 4,500	\$ 49,500
1.16	Culverts / Misc. Access	12	EA	\$ 750	\$ 9,000	\$ 1,250	\$ 15,000	\$ 2,000	\$ 24,000
1.17	Concrete Washout Station	30	EA	\$ -	\$ -	\$ 1,850	\$ 55,500	\$ 1,850	\$ 55,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 31,000		\$ 11,223,694		\$ 11,254,694
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 4' x 16'	100	EA	\$ 941	\$ 94,073	\$ 7,398	\$ 739,787	\$ 8,339	\$ 833,860
2.2	Direct Embed Foundations - 4' x 19'	14	EA	\$ 1,104	\$ 15,455	\$ 8,703	\$ 121,847	\$ 9,807	\$ 137,302
2.3	Direct Embed Foundations - 4' x 21'	2	EA	\$ 1,213	\$ 2,425	\$ 9,574	\$ 19,147	\$ 10,786	\$ 21,573
2.4	Direct Embed Foundations - 6' x 18'	9	EA	\$ 1,857	\$ 16,717	\$ 18,603	\$ 167,431	\$ 20,461	\$ 184,148
2.5	Direct Embed Foundations - 6' x 20'	14	EA	\$ 2,046	\$ 28,648	\$ 20,562	\$ 287,864	\$ 22,608	\$ 316,512
2.6	Direct Embed Foundations - 6' x 21'	25	EA	\$ 2,141	\$ 53,516	\$ 21,541	\$ 538,521	\$ 23,681	\$ 592,037
2.7	Direct Embed Foundations - 6' x 22'	4	EA	\$ 2,235	\$ 8,940	\$ 22,520	\$ 90,080	\$ 24,755	\$ 99,020
2.8	Direct Embed Foundations - 6' x 25'	5	EA	\$ 2,518	\$ 12,591	\$ 25,457	\$ 127,287	\$ 27,976	\$ 139,878
2.9	Direct Embed Foundations - 6' x 29'	1	EA	\$ 2,896	\$ 2,896	\$ 29,374	\$ 29,374	\$ 32,270	\$ 32,270
2.10	Direct Embed Foundations - 6' x 34'	4	EA	\$ 3,273	\$ 13,093	\$ 33,290	\$ 133,162	\$ 36,564	\$ 146,255
2.11	Direct Embed Foundations - 6' x 42'	3	EA	\$ 4,123	\$ 12,369	\$ 42,103	\$ 126,308	\$ 46,225	\$ 138,676
2.12	Direct Embed Foundations - 7' x 25'	1	EA	\$ 3,105	\$ 3,105	\$ 34,650	\$ 34,650	\$ 37,756	\$ 37,756
2.13	Direct Embed Foundations - 7' x 27'	1	EA	\$ 3,337	\$ 3,337	\$ 37,316	\$ 37,316	\$ 40,652	\$ 40,652
2.14	Direct Embed Foundations - 7' x 28'	1	EA	\$ 3,452	\$ 3,452	\$ 38,648	\$ 38,648	\$ 42,101	\$ 42,101
2.15	Drilled Pier - 6' x 20'	6	EA	\$ 18,064	\$ 108,384	\$ 18,261	\$ 109,564	\$ 36,325	\$ 217,949
2.16	Drilled Pier - 7' x 19'	15	EA	\$ 23,416	\$ 351,246	\$ 23,671	\$ 355,070	\$ 47,088	\$ 706,315
2.17	Drilled Pier - 7' x 24'	3	EA	\$ 29,270	\$ 87,811	\$ 29,589	\$ 88,767	\$ 58,860	\$ 176,579
2.18	Drilled Pier - 8' x 27'	1	EA	\$ 42,819	\$ 42,819	\$ 43,285	\$ 43,285	\$ 86,103	\$ 86,103
2.19	Drilled Pier - 8' x 83'	1	EA	\$ 128,456	\$ 128,456	\$ 172,020	\$ 172,020	\$ 300,475	\$ 300,475
2.20	Drilled Pier - 8' x 89'	1	EA	\$ 137,631	\$ 137,631	\$ 184,307	\$ 184,307	\$ 321,938	\$ 321,938

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.21	Drilled Pier - 9' x 34'	1	EA	\$ 67,740	\$ 67,740	\$ 90,713	\$ 90,713	\$ 158,454	\$ 158,454
2.22	Rock Excavation Adder	482.40	CY	\$ -	\$ -	\$ 2,000	\$ 964,800	\$ 2,000	\$ 964,800
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,194,705		\$ 4,499,949		\$ 5,694,653
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 50,024	\$ 350,168	\$ 30,014	\$ 210,101	\$ 80,038	\$ 560,269
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 120'	5	Structure	\$ 52,207	\$ 261,035	\$ 31,324	\$ 156,621	\$ 83,531	\$ 417,656
3.3	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 125'	8	Structure	\$ 55,685	\$ 445,480	\$ 33,411	\$ 267,288	\$ 89,096	\$ 712,768
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 130'	9	Structure	\$ 58,257	\$ 524,309	\$ 34,954	\$ 314,585	\$ 93,210	\$ 838,894
3.5	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 135'	4	Structure	\$ 60,884	\$ 243,534	\$ 36,530	\$ 146,120	\$ 97,414	\$ 389,654
3.6	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 145'	1	Structure	\$ 64,473	\$ 64,473	\$ 38,684	\$ 38,684	\$ 103,156	\$ 103,156
3.7	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 115'	1	Structure	\$ 72,039	\$ 72,039	\$ 43,223	\$ 43,223	\$ 115,262	\$ 115,262
3.8	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 135'	1	Structure	\$ 92,278	\$ 92,278	\$ 55,367	\$ 55,367	\$ 147,645	\$ 147,645
3.9	1-CKT 345KV VERTICAL TANGENT DEADEND (0°-5°) - 120'	1	Structure	\$ 58,164	\$ 58,164	\$ 34,898	\$ 34,898	\$ 93,062	\$ 93,062
3.10	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 105'	1	Structure	\$ 98,883	\$ 98,883	\$ 59,330	\$ 59,330	\$ 158,212	\$ 158,212
3.11	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 84'	43	Structure	\$ 29,526	\$ 1,269,618	\$ 17,716	\$ 761,771	\$ 47,242	\$ 2,031,389
3.12	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 89'	5	Structure	\$ 32,708	\$ 163,540	\$ 19,625	\$ 98,124	\$ 52,333	\$ 261,664
3.13	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 93'	5	Structure	\$ 34,540	\$ 172,698	\$ 20,724	\$ 103,619	\$ 55,263	\$ 276,316
3.14	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 107'	5	Structure	\$ 45,936	\$ 229,678	\$ 27,561	\$ 137,807	\$ 73,497	\$ 367,484
3.15	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 80'	3	Structure	\$ 55,241	\$ 165,723	\$ 33,145	\$ 99,434	\$ 88,386	\$ 265,157
3.16	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 80'	5	Structure	\$ 69,079	\$ 345,395	\$ 41,447	\$ 207,237	\$ 110,526	\$ 552,632
3.17	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 85'	1	Structure	\$ 75,739	\$ 75,739	\$ 45,443	\$ 45,443	\$ 121,182	\$ 121,182
3.18	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 80'	5	Structure	\$ 97,403	\$ 487,013	\$ 58,442	\$ 292,208	\$ 155,844	\$ 779,220
3.19	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 95'	1	Structure	\$ 129,408	\$ 129,408	\$ 77,645	\$ 77,645	\$ 207,052	\$ 207,052
3.20	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 178,026	\$ 178,026	\$ 106,815	\$ 106,815	\$ 284,841	\$ 284,841
3.21	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 54,631	\$ 382,414	\$ 32,778	\$ 229,448	\$ 87,409	\$ 611,862
3.22	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 125'	4	Structure	\$ 62,604	\$ 250,416	\$ 37,562	\$ 150,250	\$ 100,166	\$ 400,666
3.23	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 135'	1	Structure	\$ 68,894	\$ 68,894	\$ 41,336	\$ 41,336	\$ 110,230	\$ 110,230
3.24	2-CKT 115KV/345KV VERTICAL SMALL ANGLE (1°-15°) - 155'	1	Structure	\$ 149,480	\$ 149,480	\$ 89,688	\$ 89,688	\$ 239,168	\$ 239,168
3.25	2-CKT 115KV/345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 173,808	\$ 173,808	\$ 104,285	\$ 104,285	\$ 278,092	\$ 278,092
3.26	2-CKT 115KV/345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 125'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.27	115KV DUMMY DE, Drilled Pier, 85'	2	Structure	\$ 58,164	\$ 116,328	\$ 34,898	\$ 69,797	\$ 93,062	\$ 186,125
3.28	Remove Existing Foundation	4	EA	\$ -	\$ -	\$ 7,500	\$ 30,000	\$ 7,500	\$ 30,000
3.29	Remove Existing Structure and Accessories	24	EA	\$ -	\$ -	\$ 12,500	\$ 300,000	\$ 12,500	\$ 300,000
3.30	Install Grounding and Grounding Accessories	214	Pole	\$ 506	\$ 108,284	\$ 5,539	\$ 1,185,239	\$ 6,045	\$ 1,293,523
<b>TOTAL - STRUCTURES:</b>					\$ 6,879,617		\$ 5,578,039		\$ 12,457,656
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal" (ENS-336 to ENS-464)	661,954	LF	\$ 1.90	\$ 1,257,713	\$ 5.00	\$ 3,309,770	\$ 6.90	\$ 4,567,483
4.2	(1) OPGW 36 Fiber AC-33/38/571 (ENS-336 to ENS-464)	110,326	LF	\$ 1.35	\$ 148,940	\$ 5.00	\$ 551,630	\$ 6.35	\$ 700,570
4.3	(1) 3/8" EHS7 Steel (ENS-336 to ENS-464)	75,398	LF	\$ 0.47	\$ 35,437	\$ 5.00	\$ 376,990	\$ 5.47	\$ 412,427
4.4		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.5	115KV - (1) 954kcmil 54/7 ACSS "Cardinal" (ENS-336 to ENS-464)	41,580	LF	\$ 1.90	\$ 79,002	\$ 5.00	\$ 207,900	\$ 6.90	\$ 286,902
4.6	(1) OPGW 36 Fiber AC-33/38/571 (ENS-336 to ENS-464)	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.7	(1) 3/8" EHS7 Steel (ENS-336 to ENS-464)	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.8	Remove Existing Conductor and Accessories	2.5	Mile	\$ -	\$ -	\$ 30,000	\$ 75,000	\$ 30,000.00	\$ 75,000
4.9	Remove Existing OPGW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.10	Remove Existing OHSW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.11	Rider Poles (50 Locations)	25	Set	\$ 1,750	\$ 43,750	\$ 3,500	\$ 87,500	\$ 5,250.00	\$ 131,250
4.12	Rider Poles - Relocated	25	Set	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500.00	\$ 87,500
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 1,564,842		\$ 4,756,290		\$ 6,321,132
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	538	Assembly	\$ 1,800	\$ 968,400	\$ 720	\$ 387,360	\$ 2,520	\$ 1,355,760
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	78	Assembly	\$ 900	\$ 70,200	\$ 560	\$ 43,680	\$ 1,460	\$ 113,880
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	255	Assembly	\$ 1,800	\$ 459,000	\$ 720	\$ 183,600	\$ 2,520	\$ 642,600
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	21	Assembly	\$ 900	\$ 18,900	\$ 560	\$ 11,760	\$ 1,460	\$ 30,660
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.7	OPGW Assembly - Tangent	110	Assembly	\$ 200	\$ 22,000	\$ 150	\$ 16,500	\$ 350	\$ 38,500
5.8	OPGW Assembly - Angle / DE	34	Assembly	\$ 250	\$ 8,500	\$ 150	\$ 5,100	\$ 400	\$ 13,600
5.9	OHSW Assembly - Tangent	61	Assembly	\$ 200	\$ 12,200	\$ 150	\$ 9,150	\$ 350	\$ 21,350
5.10	OHSW Assembly - Angle / DE	24	Assembly	\$ 250	\$ 6,000	\$ 150	\$ 3,600	\$ 400	\$ 9,600
5.11	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.12	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.13	Spacer - Conductor	1,773	EA	\$ 50	\$ 88,650	\$ 35	\$ 62,055	\$ 85	\$ 150,705
5.14	Vibration Dampers - Conductor	1,596	EA	\$ 35	\$ 55,860	\$ 35	\$ 55,860	\$ 70	\$ 111,720
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	293	EA	\$ 27	\$ 7,911	\$ 35	\$ 10,255	\$ 62	\$ 18,166
5.16	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.17	Misc. materials (Signs and Markers)	19.9	Mile	\$ 770	\$ 15,323	\$ 1,006	\$ 20,019	\$ 1,776	\$ 35,342
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,767,073		\$ 847,291		\$ 2,614,365
<b>C. Transmission Line Princetown to New Scotland</b>					\$ 11,437,237		\$ 26,905,263		\$ 38,342,499
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,057,420	\$ 2,057,420	\$ 2,057,420	\$ 2,057,420
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,917,125	\$ 1,917,125	\$ 1,917,125	\$ 1,917,125
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 115,027	\$ 115,027	\$ 115,027	\$ 115,027
6.7	Geotech	20	Location	\$ -	\$ -	\$ 3,500	\$ 70,000	\$ 3,500	\$ 70,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 268,397	\$ 268,397	\$ 268,397	\$ 268,397
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 115,027	\$ 115,027	\$ 115,027	\$ 115,027
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 215,000	\$ 215,000	\$ 215,000	\$ 215,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,477,000	\$ 2,477,000	\$ 2,477,000	\$ 2,477,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 914,979	\$ 914,979	\$ -	\$ -	\$ 914,979	\$ 914,979
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 38,342	\$ 38,342	\$ 38,342	\$ 38,342
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 914,979		\$ 8,463,615		\$ 9,378,594

**NAT & NYPA - T026 - (Segment A, Base)**

**D. Rotterdam Substation - Install**

Estimate Revision: 7

Total: \$ 55,885,503

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>D. Rotterdam Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,896,891	\$ 8,763,755	\$ 11,660,646
2. SUBSTATION FOUNDATIONS	\$ 2,443,003	\$ 2,616,200	\$ 5,059,203
3. SUBSTATION STRUCTURES	\$ 944,980	\$ 944,980	\$ 1,889,960
4. MAJOR EQUIPMENT	\$ 11,915,000	\$ 2,970,000	\$ 14,885,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,994,540	\$ 1,060,500	\$ 3,055,040
6. CONTROL HOUSE / PANELS	\$ 2,927,500	\$ 1,477,500	\$ 4,405,000
7. MISC ITEMS	\$ 1,441,675	\$ 2,331,950	\$ 3,773,625
8. MOB/DEMOP, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,965,087	\$ 9,191,942	\$ 11,157,029
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 26,528,676</b>	<b>\$ 29,356,827</b>	<b>\$ 55,885,503</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 26,528,676</b>	<b>\$ 29,356,827</b>	<b>\$ 55,885,503</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Rotterdam Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	7.4	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,497,125	\$ 203,000	\$ 1,497,125
1.2	Station stone within substation fence.	3,175	CY	\$ 27	\$ 85,725	\$ 75	\$ 238,125	\$ 102	\$ 323,850
1.3	Substation Fence	2,130	LF	\$ 100	\$ 213,000	\$ 100	\$ 213,000	\$ 200	\$ 426,000
1.4	Retaining Wall (1065' x 13')	1	LS	\$ 406,755	\$ 406,755	\$ 925,345	\$ 925,345	\$ 1,332,100	\$ 1,332,100
1.5	Compacted Fill (124,583cy Sand)	124,583	CY	\$ 17	\$ 2,117,911	\$ 20	\$ 2,491,660	\$ 37	\$ 4,609,571
1.6	Permanent Access Road - 20'-Wide (From Gordon RD)	2,100	LF	\$ 35	\$ 73,500	\$ 285	\$ 598,500	\$ 320	\$ 672,000
1.7	Natural Gas Transmission Line Relocation	1	LS	\$ -		\$ 2,800,000	\$ 2,800,000	\$ 2,800,000	\$ 2,800,000
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,896,891		\$ 8,763,755		\$ 11,660,646
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345KV</b>									
2.1a	Circuit Breaker Foundations	8	EA	\$ 14,940	\$ 119,520	\$ 16,000	\$ 128,000	\$ 30,940	\$ 247,520
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	32	EA	\$ 26,145	\$ 836,640	\$ 28,000	\$ 896,000	\$ 54,145	\$ 1,732,640
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	102	EA	\$ 4,482	\$ 457,164	\$ 4,800	\$ 489,600	\$ 9,282	\$ 946,764
2.1f	Station Service Transformer Stand Foundation	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	42	EA	\$ 4,482	\$ 188,244	\$ 4,800	\$ 201,600	\$ 9,282	\$ 389,844
2.1j	Instrument Transformer Stand Foundations	33	EA	\$ 4,482	\$ 147,906	\$ 4,800	\$ 158,400	\$ 9,282	\$ 306,306
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	1	EA	\$ 11,952	\$ 11,952	\$ 12,800	\$ 12,800	\$ 24,752	\$ 24,752
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 22,410	\$ 89,640	\$ 24,000	\$ 96,000	\$ 46,410	\$ 185,640
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	8	EA	\$ 3,735	\$ 29,880	\$ 4,000	\$ 32,000	\$ 7,735	\$ 61,880
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	9	EA	\$ 3,735	\$ 33,615	\$ 4,000	\$ 36,000	\$ 7,735	\$ 69,615
2.2k	Arrester Stand Foundations	3	EA	\$ 3,735	\$ 11,205	\$ 4,000	\$ 12,000	\$ 7,735	\$ 23,205
2.2m	Wave Trap Stand Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 16,434	\$ 65,736	\$ 17,600	\$ 70,400	\$ 34,034	\$ 136,136
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.4b	345-115kV Transformer Foundation w/ Oil Containment	2	EA	\$ 74,700	\$ 149,400	\$ 80,000	\$ 160,000	\$ 154,700	\$ 309,400
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 2,443,003		\$ 2,616,200		\$ 5,059,203
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	8	EA	\$ 37,000	\$ 296,000	\$ 37,000	\$ 296,000	\$ 74,000	\$ 592,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	17	EA	\$ 14,800	\$ 251,600	\$ 14,800	\$ 251,600	\$ 29,600	\$ 503,200

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	42	EA	\$ 3,700	\$ 155,400	\$ 3,700	\$ 155,400	\$ 7,400	\$ 310,800
3.1g	Instrument Transformer Stand	33	EA	\$ 1,850	\$ 61,050	\$ 1,850	\$ 61,050	\$ 3,700	\$ 122,100
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ 33,300	\$ 33,300	\$ 33,300	\$ 33,300	\$ 66,600	\$ 66,600
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	2	EA	\$ 12,025	\$ 24,050	\$ 12,025	\$ 24,050	\$ 24,050	\$ 48,100
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	9	EA	\$ 1,295	\$ 11,655	\$ 1,295	\$ 11,655	\$ 2,590	\$ 23,310
3.2h	Arrester Stand	3	EA	\$ 1,295	\$ 3,885	\$ 1,295	\$ 3,885	\$ 2,590	\$ 7,770
3.2j	Wave Trap Stand	1	EA	\$ 5,550	\$ 5,550	\$ 5,550	\$ 5,550	\$ 11,100	\$ 11,100
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	2	EA	\$ 7,955	\$ 15,910	\$ 7,955	\$ 15,910	\$ 15,910	\$ 31,820
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 944,980		\$ 944,980		\$ 1,889,960
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	8	EA	\$ 200,000	\$ 1,600,000	\$ 80,000	\$ 640,000	\$ 280,000	\$ 2,240,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	1	EA	\$ 3,400,000	\$ 3,400,000	\$ 750,000	\$ 750,000	\$ 4,150,000	\$ 4,150,000
4.1d	345 kV - 115 kV Auto Transformer	2	EA	\$ 3,400,000	\$ 6,800,000	\$ 750,000	\$ 1,500,000	\$ 4,150,000	\$ 8,300,000
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	1	EA	\$ 115,000	\$ 115,000	\$ 80,000	\$ 80,000	\$ 195,000	\$ 195,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 11,915,000		\$ 2,970,000		\$ 14,885,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.1b	Disconnect Switches - 3ph w/ manual operator	17	EA	\$ 35,000	\$ 595,000	\$ 17,500	\$ 297,500	\$ 52,500	\$ 892,500
5.1c	VT'S	6	EA	\$ 25,000	\$ 150,000	\$ 12,000	\$ 72,000	\$ 37,000	\$ 222,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	21	EA	\$ 13,000	\$ 273,000	\$ 8,000	\$ 168,000	\$ 21,000	\$ 441,000
5.1f	Arresters	15	EA	\$ 6,500	\$ 97,500	\$ 1,500	\$ 22,500	\$ 8,000	\$ 120,000
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	1	EA	\$ 35,000	\$ 35,000	\$ 15,000	\$ 15,000	\$ 50,000	\$ 50,000
5.2b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 30,000	\$ 30,000	\$ 17,500	\$ 17,500	\$ 47,500	\$ 47,500
5.2c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2e	CCVT'S	3	EA	\$ 10,000	\$ 30,000	\$ 6,000	\$ 18,000	\$ 16,000	\$ 48,000
5.2f	Arresters	6	EA	\$ 5,000	\$ 30,000	\$ 6,000	\$ 36,000	\$ 11,000	\$ 66,000
5.2g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	2	EA	\$ 8,000	\$ 16,000	\$ 8,000	\$ 16,000	\$ 16,000	\$ 32,000
5.3f	Arresters	12	EA	\$ 3,420	\$ 41,040	\$ 6,000	\$ 72,000	\$ 9,420	\$ 113,040
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,994,540		\$ 1,060,500		\$ 3,055,040
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 975,000	\$ 975,000	\$ 170,000	\$ 170,000	\$ 1,145,000	\$ 1,145,000
6.2	Protection and Telecom Equipment Panels	29	EA	\$ 35,000	\$ 1,015,000	\$ 10,000	\$ 290,000	\$ 45,000	\$ 1,305,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 472,500	\$ 472,500	\$ 472,500	\$ 472,500	\$ 945,000	\$ 945,000
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,927,500		\$ 1,477,500		\$ 4,405,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,950	LF	\$ 185.00	\$ 360,750	\$ 170.00	\$ 331,500	\$ 355	\$ 692,250
7.2	Rigid Bus, Fittings & Insulators	2,500	LF	\$ 125.07	\$ 312,675	\$ 237.10	\$ 592,750	\$ 362	\$ 905,425

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.3	Strain Bus, Connectors & Insulators	2,000	LF	\$ 39.30	\$ 78,600	\$ 53.35	\$ 106,700	\$ 93	\$ 185,300
7.4	Grounding System	25,000	LF	\$ 6.93	\$ 173,250	\$ 32.58	\$ 814,500	\$ 40	\$ 987,750
7.5	Strain Bus Insulators - 345kV	48	EA	\$ 2,000	\$ 96,000	\$ 1,050	\$ 50,400	\$ 3,050	\$ 146,400
7.6	Strain Bus Insulators - 230kV	6	EA	\$ 1,400	\$ 8,400	\$ 750	\$ 4,500	\$ 2,150	\$ 12,900
7.7	Strain Bus Insulators - 115kV	12	EA	\$ 1,000	\$ 12,000	\$ 550	\$ 6,600	\$ 1,550	\$ 18,600
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
<b>TOTAL - MISC ITEMS</b>					\$ 1,441,675		\$ 2,331,950		\$ 3,773,625
<b>D. Rotterdam Substation - Install</b>					\$ 24,563,589		\$ 20,164,885		\$ 44,728,474
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,400,085	\$ 2,400,085	\$ 2,400,085	\$ 2,400,085
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,578,278	\$ 3,578,278	\$ 3,578,278	\$ 3,578,278
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 313,099	\$ 313,099	\$ 313,099	\$ 313,099
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,118,212	\$ 1,118,212	\$ 1,118,212	\$ 1,118,212
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 134,185	\$ 134,185	\$ 134,185	\$ 134,185
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 247,500	\$ 247,500	\$ 247,500	\$ 247,500
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,965,087	\$ 1,965,087	\$ -	\$ -	\$ 1,965,087	\$ 1,965,087
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 44,728	\$ 44,728	\$ 44,728	\$ 44,728
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,965,087		\$ 9,191,942		\$ 11,157,029

**NAT & NYPA - T026 - (Segment A, Base)**

**E. Rotterdam Substation - Removal**

Estimate Revision: **7** Total: \$ **4,216,452**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>E. Rotterdam Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 1,472,750	\$ 1,472,750
2. SUBSTATION FOUNDATIONS	\$ -	\$ 617,400	\$ 617,400
3. SUBSTATION STRUCTURES	\$ -	\$ 534,900	\$ 534,900
4. MAJOR EQUIPMENT	\$ -	\$ 147,000	\$ 147,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 169,500	\$ 169,500
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 519,480	\$ 519,480
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 605,422	\$ 605,422
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 4,216,452	\$ 4,216,452
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 4,216,452	\$ 4,216,452

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>E. Rotterdam Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	6.3	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,268,750	\$ 203,000	\$ 1,268,750
1.2	Station stone within substation fence.	2,000	CY	\$ -	\$ -	\$ 102	\$ 204,000	\$ 102	\$ 204,000
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 1,472,750		\$ 1,472,750
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	9	EA	\$ -	\$ -	\$ 7,200	\$ 64,800	\$ 7,200	\$ 64,800
2.2b	Capacitor Bank Foundations	2	EA	\$ -	\$ -	\$ 32,000	\$ 64,000	\$ 32,000	\$ 64,000
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	1	EA	\$ -	\$ -	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	15	EA	\$ -	\$ -	\$ 5,200	\$ 78,000	\$ 5,200	\$ 78,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	4	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	59	EA	\$ -	\$ -	\$ 2,400	\$ 141,600	\$ 2,400	\$ 141,600
2.2j	Instrument Transformer Stand Foundations	15	EA	\$ -	\$ -	\$ 2,400	\$ 36,000	\$ 2,400	\$ 36,000
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	3	EA	\$ -	\$ -	\$ 42,000	\$ 126,000	\$ 42,000	\$ 126,000
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 617,400		\$ 617,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ -	\$ -	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	15	EA	\$ -	\$ -	\$ 9,750	\$ 146,250	\$ 9,750	\$ 146,250
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	4	EA	\$ -	\$ -	\$ 2,250	\$ 9,000	\$ 2,250	\$ 9,000
3.2f	Bus Support 1 Ph	59	EA	\$ -	\$ -	\$ 2,250	\$ 132,750	\$ 2,250	\$ 132,750
3.2g	Instrument Transformer Stand	15	EA	\$ -	\$ -	\$ 1,050	\$ 15,750	\$ 1,050	\$ 15,750
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	3	EA	\$ -	\$ -	\$ 4,500	\$ 13,500	\$ 4,500	\$ 13,500
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 534,900		\$ 534,900
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	9	EA	\$ -	\$ -	\$ 7,000	\$ 63,000	\$ 7,000	\$ 63,000
4.2b	Capacitor Banks	2	EA	\$ -	\$ -	\$ 42,000	\$ 84,000	\$ 42,000	\$ 84,000
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 147,000		\$ 147,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2b	Disconnect Switches - 3ph w/ manual operator	12	EA	\$ -	\$ -	\$ 5,500	\$ 66,000	\$ 5,500	\$ 66,000
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	8	EA	\$ -	\$ -	\$ 1,500	\$ 12,000	\$ 1,500	\$ 12,000
5.2f	Arresters	15	EA	\$ -	\$ -	\$ 2,500	\$ 37,500	\$ 2,500	\$ 37,500
5.2g	Wave Traps	3	EA	\$ -	\$ -	\$ 2,500	\$ 7,500	\$ 2,500	\$ 7,500
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 169,500		\$ 169,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.2	Rigid Bus, Fittings & Insulators	3,200	LF	\$ -	\$ -	\$ 126.25	\$ 404,000	\$ 126	\$ 404,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.3	Strain Bus, Connectors & Insulators	800	LF	\$ -	\$ -	\$ 39.35	\$ 31,480	\$ 39	\$ 31,480
7.4	Grounding System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 519,480		\$ 519,480
<b>E. Rotterdam Substation - Removal</b>					\$ -		\$ 3,611,030		\$ 3,611,030
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS	\$ -	\$ -	\$ 193,764	\$ 193,764	\$ 193,764	\$ 193,764
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 288,882	\$ 288,882	\$ 288,882	\$ 288,882
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 25,277	\$ -	\$ 25,277	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 90,276	\$ -	\$ 90,276	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 10,833	\$ 10,833	\$ 10,833	\$ 10,833
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 3,611	\$ 3,611	\$ 3,611	\$ 3,611
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 605,422		\$ 605,422

**NAT & NYPA - T026 - (Segment A, Base)**

**F. Edic Substation - Install**

Estimate Revision: **7**

Total: \$ **2,645,078**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>F. Edic Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,025	\$ 5,625	\$ 7,650
2. SUBSTATION FOUNDATIONS	\$ 100,098	\$ 107,200	\$ 207,298
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 280,000	\$ 133,500	\$ 413,500
6. CONTROL HOUSE / PANELS	\$ 173,850	\$ 98,850	\$ 272,700
7. MISC ITEMS	\$ 339,357	\$ 507,880	\$ 847,237
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 91,178	\$ 436,715	\$ 527,893
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,230,908	\$ 1,414,170	\$ 2,645,078
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,230,908	\$ 1,414,170	\$ 2,645,078

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Edic Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,025		\$ 5,625		\$ 7,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 100,098		\$ 107,200		\$ 207,298
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 280,000		\$ 133,500		\$ 413,500

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 10,000	\$ 30,000	\$ 45,000	\$ 135,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 68,850	\$ 68,850	\$ 68,850	\$ 68,850	\$ 137,700	\$ 137,700
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 173,850		\$ 98,850		\$ 272,700
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	L.S.	\$ 75,042.00	\$ -	\$ 142,260.00	\$ -	\$ 217,302	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 39.30	\$ 98,250	\$ 53.35	\$ 133,375	\$ 93	\$ 231,625
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 73,305.00	\$ 73,305	\$ 83,700	\$ 83,700
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 339,357		\$ 507,880		\$ 847,237
<b>F. Edic Substation - Install</b>					\$ 1,139,730		\$ 977,455		\$ 2,117,185
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 113,606	\$ 113,606	\$ 113,606	\$ 113,606
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 169,375	\$ 169,375	\$ 169,375	\$ 169,375
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,820	\$ 14,820	\$ 14,820	\$ 14,820
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,930	\$ 52,930	\$ 52,930	\$ 52,930
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,352	\$ 6,352	\$ 6,352	\$ 6,352
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 91,178	\$ 91,178	\$ -	\$ -	\$ 91,178	\$ 91,178
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,117	\$ 2,117	\$ 2,117	\$ 2,117
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 91,178		\$ 436,715		\$ 527,893

**NAT & NYPA - T026 - (Segment A, Base)**

**G. Edic Substation - Removal**

Estimate Revision: **7**

Total: \$ **41,708**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>G. Edic Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 14,000	\$ 14,000
3. SUBSTATION STRUCTURES	\$ -	\$ 6,750	\$ 6,750
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ 10,500
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 5,958	\$ 5,958
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 31,208	\$ 41,708
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 31,208	\$ 41,708

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Edic Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.			\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence			\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 14,000	\$ 14,000	\$ 14,000	\$ 14,000
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 14,000		\$ 14,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	3	EA	\$ -	\$ -	\$ 2,250	\$ 6,750	\$ 2,250	\$ 6,750
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 6,750		\$ 6,750
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 10,500.00	\$ 10,500	\$ 10,500	\$ 10,500
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 10,500		\$ 10,500
<b>G. Edic Substation - Removal</b>					\$ -		\$ 35,750		\$ 35,750
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 358	\$ 358	\$ 358	\$ 358
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS	\$ -	\$ -	\$ 1,918	\$ 1,918	\$ 1,918	\$ 1,918
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 358	\$ 358	\$ 358	\$ 358
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 358	\$ 358	\$ 358	\$ 358
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,860	\$ 2,860	\$ 2,860	\$ 2,860
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 250	\$ -	\$ 250	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 894	\$ -	\$ 894	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 107	\$ 107	\$ 107	\$ 107
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 36	\$ -	\$ 36	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 5,958		\$ 5,958

**NAT & NYPA - T026 - (Segment A, Base)**

**H. New Scotland Substation - Install**

Estimate Revision: **7**

Total: \$ **6,456,780**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>H. New Scotland Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 4,050	\$ 11,250	\$ 15,300
2. SUBSTATION FOUNDATIONS	\$ 406,368	\$ 435,200	\$ 841,568
3. SUBSTATION STRUCTURES	\$ 199,800	\$ 199,800	\$ 399,600
4. MAJOR EQUIPMENT	\$ 600,000	\$ 240,000	\$ 840,000
5. SMALL EQUIPMENT / MATERIALS	\$ 353,000	\$ 192,500	\$ 545,500
6. CONTROL HOUSE / PANELS	\$ 726,650	\$ 500,400	\$ 1,227,050
7. MISC ITEMS	\$ 525,680	\$ 788,055	\$ 1,313,735
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 225,244	\$ 1,048,783	\$ 1,274,027
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 3,040,792	\$ 3,415,988	\$ 6,456,780
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 3,040,792	\$ 3,415,988	\$ 6,456,780

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. New Scotland Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	150	CY	\$ 27	\$ 4,050	\$ 75	\$ 11,250	\$ 102	\$ 15,300
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide (From Gordon RD)	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 4,050		\$ 11,250		\$ 15,300
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	24	EA	\$ 4,482	\$ 107,568	\$ 4,800	\$ 115,200	\$ 9,282	\$ 222,768
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	15	EA	\$ 4,482	\$ 67,230	\$ 4,800	\$ 72,000	\$ 9,282	\$ 139,230
2.1j	Instrument Transformer Stand Foundations	12	EA	\$ 4,482	\$ 53,784	\$ 4,800	\$ 57,600	\$ 9,282	\$ 111,384
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
					\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 406,368		\$ 435,200		\$ 841,568
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	4	EA	\$ 14,800	\$ 59,200	\$ 14,800	\$ 59,200	\$ 29,600	\$ 118,400
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	15	EA	\$ 3,700	\$ 55,500	\$ 3,700	\$ 55,500	\$ 7,400	\$ 111,000
3.1g	Instrument Transformer Stand	12	EA	\$ 1,850	\$ 22,200	\$ 1,850	\$ 22,200	\$ 3,700	\$ 44,400
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Lightning Masts - 70'	2	EA	\$ 6,475	\$ 12,950	\$ 6,475	\$ 12,950	\$ 12,950	\$ 25,900
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 199,800		\$ 199,800		\$ 399,600
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 600,000		\$ 240,000		\$ 840,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ 35,000	\$ 105,000	\$ 17,500	\$ 52,500	\$ 52,500	\$ 157,500
5.1c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 12,000	\$ 36,000	\$ 25,000	\$ 75,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j		0	EA	\$ 15,000	\$ -	\$ 7,500	\$ -	\$ 22,500	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 353,000		\$ 192,500		\$ 545,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 243,750	\$ 243,750	\$ 42,500	\$ 42,500	\$ 286,250	\$ 286,250

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	5	EA	\$ 35,000	\$ 175,000	\$ 10,000	\$ 50,000	\$ 45,000	\$ 225,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 207,900	\$ 207,900	\$ 207,900	\$ 207,900	\$ 415,800	\$ 415,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.7	DC Distribution System	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 726,650		\$ 500,400		\$ 1,227,050
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	L.S.	\$ 55,500.00	\$ 55,500	\$ 76,500.00	\$ 76,500	\$ 132,000	\$ 132,000
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ 62,535.00	\$ 62,535	\$ 118,550.00	\$ 118,550	\$ 181,085	\$ 181,085
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ 92,250.00	\$ 92,250	\$ 114,135.00	\$ 114,135	\$ 206,385	\$ 206,385
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 48,870.00	\$ 48,870	\$ 59,265	\$ 59,265
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12	Install new communication tower foundation.	1	LS		\$ -	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000
7.13	Relocate exiting communication tower.	1	LS		\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 525,680		\$ 788,055		\$ 1,313,735
<b>H. New Scotland Substation - Install</b>					\$ 2,815,548		\$ 2,367,205		\$ 5,182,753
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 51,828	\$ 51,828	\$ 51,828	\$ 51,828
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 278,101	\$ 278,101	\$ 278,101	\$ 278,101
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 51,828	\$ 51,828	\$ 51,828	\$ 51,828
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 51,828	\$ 51,828	\$ 51,828	\$ 51,828
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 414,620	\$ 414,620	\$ 414,620	\$ 414,620
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 36,279	\$ 36,279	\$ 36,279	\$ 36,279
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 129,569	\$ 129,569	\$ 129,569	\$ 129,569
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 15,548	\$ 15,548	\$ 15,548	\$ 15,548
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ 247,500	\$ -	\$ 247,500	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 225,244	\$ 225,244	\$ -	\$ -	\$ 225,244	\$ 225,244
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 5,183	\$ 5,183	\$ 5,183	\$ 5,183
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 225,244		\$ 1,048,783		\$ 1,274,027

**NAT & NYPA - T026 - (Segment A, Base)**

**I. New Scotland Substation - Removal**

Estimate Revision: **7**

Total: \$ **94,849**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>I. New Scotland Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 28,800	\$ 28,800
3. SUBSTATION STRUCTURES	\$ -	\$ 27,000	\$ 27,000
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 21,000	\$ 21,000
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 13,549	\$ 13,549
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 94,849	\$ 94,849
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 94,849	\$ 94,849

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. New Scotland Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	12	EA	\$ -	\$ -	\$ 2,400	\$ 28,800	\$ 2,400	\$ 28,800
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 28,800		\$ 28,800
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	12	EA	\$ -	\$ -	\$ 2,250	\$ 27,000	\$ 2,250	\$ 27,000
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 27,000		\$ 27,000
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cable	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 21,000.00	\$ 21,000	\$ 21,000	\$ 21,000
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 21,000		\$ 21,000
<b>I. New Scotland Substation - Removal</b>					\$ -		\$ 81,300		\$ 81,300
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 813	\$ 813	\$ 813	\$ 813
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 4,362	\$ 4,362	\$ 4,362	\$ 4,362
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 813	\$ 813	\$ 813	\$ 813
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 813	\$ 813	\$ 813	\$ 813
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 6,504	\$ 6,504	\$ 6,504	\$ 6,504
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 569	\$ -	\$ 569	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 2,033	\$ -	\$ 2,033	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 244	\$ 244	\$ 244	\$ 244
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 81	\$ -	\$ 81	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 13,549		\$ 13,549

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**J. Porter Substation - Install**

Estimate Revision: **7**

Total: \$ **87,471**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ 15,008	\$ 56,904	\$ 71,912
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,201	\$ 14,358	\$ 15,559
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 16,209</b>	<b>\$ 71,262</b>	<b>\$ 87,471</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 16,209</b>	<b>\$ 71,262</b>	<b>\$ 87,471</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Porter Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>						\$ -	\$ -	\$ -	\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j		0	EA	\$ 15,000	\$ -	\$ 7,500	\$ -	\$ 22,500	\$ -
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ 35,000	\$ -	\$ 10,000	\$ -	\$ 45,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cable	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ 15,008.40	\$ 15,008	\$ 56,904.00	\$ 56,904	\$ 71,912	\$ 71,912
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Cables	0	LS	\$ 472,500	\$ -	\$ 472,500	\$ -	\$ 945,000	\$ -
7.11	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.12	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>J. Porter Substation - Install</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS	\$ -	\$ -	\$ 3,859	\$ 3,859	\$ 3,859	\$ 3,859
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,753	\$ 5,753	\$ 5,753	\$ 5,753
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 503	\$ 503	\$ 503	\$ 503
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,798	\$ 1,798	\$ 1,798	\$ 1,798
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 216	\$ 216	\$ 216	\$ 216
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,201	\$ 1,201	\$ -	\$ -	\$ 1,201	\$ 1,201
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 72	\$ 72	\$ 72	\$ 72
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,201		\$ 14,358		\$ 15,559

**NAT & NYPA - T026 - (Segment A, Base)**

**K. Porter Substation - Removal**

Estimate Revision: **7**

Total: \$ **553,361**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>K. Porter Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 126,600	\$ 126,600
3. SUBSTATION STRUCTURES	\$ -	\$ 206,100	\$ 206,100
4. MAJOR EQUIPMENT	\$ -	\$ 43,500	\$ 43,500
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 59,500	\$ 59,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 38,613	\$ 38,613
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 79,048	\$ 79,048
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 553,361	\$ 553,361
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 553,361	\$ 553,361

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Porter Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	3	EA	\$ -	\$ -	\$ 7,200	\$ 21,600	\$ 7,200	\$ 21,600
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	5	EA	\$ -	\$ -	\$ 5,200	\$ 26,000	\$ 5,200	\$ 26,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	4	EA	\$ -	\$ -	\$ 2,400	\$ 9,600	\$ 2,400	\$ 9,600
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad (40'x125')	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 126,600		\$ 126,600
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	6	EA	\$ -	\$ -	\$ 9,750	\$ 58,500	\$ 9,750	\$ 58,500
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 206,100		\$ 206,100
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	3	EA	\$ -	\$ -	\$ 14,500	\$ 43,500	\$ 14,500	\$ 43,500
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 43,500		\$ 43,500
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	2	EA	\$ -	\$ -	\$ 5,500	\$ 11,000	\$ 5,500	\$ 11,000
5.2b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2c	VT'S	2	EA	\$ -	\$ -	\$ 1,500	\$ 3,000	\$ 1,500	\$ 3,000
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	6	EA	\$ -	\$ -	\$ 1,500	\$ 9,000	\$ 1,500	\$ 9,000
5.2f	Arresters	6	EA	\$ -	\$ -	\$ 2,500	\$ 15,000	\$ 2,500	\$ 15,000
5.2g	Wave Traps	2	EA	\$ -	\$ -	\$ 2,500	\$ 5,000	\$ 2,500	\$ 5,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 59,500		\$ 59,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cable	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ -	\$ -	\$ 18,937.50	\$ 18,938	\$ 18,938	\$ 18,938
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ -	\$ -	\$ 19,675.00	\$ 19,675	\$ 19,675	\$ 19,675
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 38,613		\$ 38,613
<b>K. Porter Substation - Removal</b>					\$ -		\$ 474,313		\$ 474,313
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS		\$ -	\$ 25,451	\$ 25,451	\$ 25,451	\$ 25,451
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 37,945	\$ 37,945	\$ 37,945	\$ 37,945
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 3,320	\$ -	\$ 3,320	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 11,858	\$ -	\$ 11,858	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,423	\$ 1,423	\$ 1,423	\$ 1,423
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ 474	\$ -	\$ 474	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 79,048		\$ 79,048

**NAT & NYPA - T026 - (Segment A, Base)**

**L. Interconnection Edic Station**

Estimate Revision: **7** Total: \$ **2,132,044**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>L. Interconnection Edic Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 168,366	\$ 170,169	\$ 338,536
3. STRUCTURES	\$ 501,469	\$ 321,821	\$ 823,289
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 160,000	\$ 94,400	\$ 254,400
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 66,387	\$ 281,583	\$ 347,969
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 896,222</b>	<b>\$ 1,235,823</b>	<b>\$ 2,132,044</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 896,222</b>	<b>\$ 1,235,823</b>	<b>\$ 2,132,044</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Edic Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ -	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ 367,850	\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 27’	3	EA	\$ 41,332	\$ 123,995	\$ 41,774	\$ 125,322	\$ 83,106	\$ 249,317
2.2	Foundation – Drilled Pier – 8’X 29’	1	EA	\$ 44,372	\$ 44,372	\$ 44,847	\$ 44,847	\$ 89,219	\$ 89,219
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.15					\$ 168,366		\$ 170,169		\$ 338,536
<b>TOTAL - FOUNDATIONS</b>									
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) – 105'	3	Structure	\$ 98,883	\$ 296,648	\$ 59,330	\$ 177,989	\$ 158,212	\$ 474,636
3.2	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.3	Install Grounding and Grounding Accessories	4	Pole	\$ 506	\$ 2,024	\$ 5,539	\$ 22,154	\$ 6,045	\$ 24,178
3.4					\$ -		\$ -		\$ -
3.5									
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>									
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>									
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)								
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)								
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)								
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.11	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15									
5.16									
5.17									
5.18									
5.19	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>									
<b>L. Interconnection Edic Station</b>									
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 95,732	\$ 95,732	\$ 95,732	\$ 95,732

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 89,204	\$ 89,204	\$ 89,204	\$ 89,204
6.6	LIDAR	-	LS	\$ -	\$ -	\$ 5,352	\$ -	\$ 5,352	\$ -
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,489	\$ 12,489	\$ 12,489	\$ 12,489
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,352	\$ 5,352	\$ 5,352	\$ 5,352
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 66,387	\$ 66,387	\$ -	\$ -	\$ 66,387	\$ 66,387
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 1,784	\$ 1,784	\$ 1,784	\$ 1,784
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 66,387		\$ 281,583		\$ 347,969

**NAT & NYPA - T026 - (Segment A, Base)**

**M. Interconnection New Scotland Station**

Estimate  
Revision: 7

Total: \$ 3,115,703

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>M. Interconnection New Scotland Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 365,657	\$ 473,093	\$ 838,749
3. STRUCTURES	\$ 655,465	\$ 445,628	\$ 1,101,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,555	\$ 26,100	\$ 29,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 161,130	\$ 95,795	\$ 256,925
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 94,864	\$ 426,567	\$ 521,432
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,835,033</b>	<b>\$ 3,115,703</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,835,033</b>	<b>\$ 3,115,703</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection New Scotland Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8'X 50'	3	EA	\$ 76,500	\$ 229,501	\$ 77,320	\$ 231,959	\$ 153,820	\$ 461,459
2.2	Foundation – Drilled Pier – 8'X 89'	1	EA	\$ 136,156	\$ 136,156	\$ 137,614	\$ 137,614	\$ 273,770	\$ 273,770
2.3	Rock Excavation Adder	51.8	CY	\$ -	\$ -	\$ 2,000	\$ 103,520	\$ 2,000	\$ 103,520
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.11									
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 365,657		\$ 473,093		\$ 838,749
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	3	Structure	\$ 178,026	\$ 534,077	\$ 106,815	\$ 320,446	\$ 284,841	\$ 854,522
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	Install Grounding and Grounding Accessories	10	Pole	\$ 506	\$ 5,060	\$ 5,539	\$ 55,385	\$ 6,045	\$ 60,445
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES</b>					\$ 655,465		\$ 445,628		\$ 1,101,092
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	1,500	LF	\$ 1.90	\$ 2,850	\$ 5.00	\$ 7,500	\$ 6.90	\$ 10,350
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	1,500	LF	\$ 0.47	\$ 705	\$ 5.00	\$ 7,500	\$ 5.47	\$ 8,205
4.5	Remove Existing 345kV Cable From Existing Structures	0.3	Mile	\$ -	\$ -	\$ 30,000	\$ 7,500	\$ 30,000.00	\$ 7,500
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	0.3	Mile	\$ -	\$ -	\$ 12,000	\$ 3,600	\$ 12,000.00	\$ 3,600
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,555		\$ 26,100		\$ 29,655
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	9	EA	\$ 50	\$ 450	\$ 35	\$ 315	\$ 85	\$ 765
5.11	Vibration Dampers - Conductor	48	EA	\$ 35	\$ 1,680	\$ 35	\$ 1,680	\$ 70	\$ 3,360
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15									
5.16	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 161,130		\$ 95,795		\$ 256,925
<b>M. Interconnection New Scotland Station</b>					\$ 1,185,806		\$ 1,408,465		\$ 2,594,271
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 139,206	\$ 139,206	\$ 139,206	\$ 139,206
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 129,714	\$ 129,714	\$ 129,714	\$ 129,714
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 18,160	\$ 18,160	\$ 18,160	\$ 18,160
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 94,864	\$ 94,864	\$ -	\$ -	\$ 94,864	\$ 94,864
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 2,594	\$ 2,594	\$ 2,594	\$ 2,594
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 94,864		\$ 426,567		\$ 521,432

**NAT & NYPA - T026 - (Segment A, Base)**

**N. Interconnection Rotterdam Station**

Estimate Revision: **7** Total: \$ 4,622,733

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>N. Interconnection Rotterdam Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,233,050	\$ 1,233,050
2. FOUNDATIONS	\$ 192,145	\$ 325,963	\$ 518,108
3. STRUCTURES	\$ 546,722	\$ 837,150	\$ 1,383,872
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 65,923	\$ 437,250	\$ 503,173
5. INSULATORS, FITTINGS, HARDWARE	\$ 165,730	\$ 118,480	\$ 284,210
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 77,642	\$ 622,679	\$ 700,321
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,574,572</b>	<b>\$ 4,622,733</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,574,572</b>	<b>\$ 4,622,733</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Rotterdam Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	7.0	Acre	\$ -	\$ -	\$ 15,000	\$ 105,000	\$ 15,000	\$ 105,000
1.2	Clearing the ROW - Light (mowing)	5.0	Acre	\$ -	\$ -	\$ 5,000	\$ 25,000	\$ 5,000	\$ 25,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	4,800.0	LF	\$ -	\$ -	\$ 4	\$ 19,200	\$ 4	\$ 19,200
1.5	Matting - Access and ROW	4,800.0	LF	\$ -	\$ -	\$ 70	\$ 336,000	\$ 70	\$ 336,000
1.6	Matting - To Work Area	2,400.0	LF	\$ -	\$ -	\$ 70	\$ 168,000	\$ 70	\$ 168,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	1.0	Mile	\$ -	\$ -	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
1.9	Work Pads	160,000.0	SF	\$ -	\$ -	\$ 4	\$ 563,200	\$ 4	\$ 563,200
1.10	Restoration for Work Pad areas	32,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 4,800	\$ 0	\$ 4,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>				\$ -	\$ -	\$ 1,233,050	\$ -	\$ 1,233,050	\$ 1,233,050
<b>2. FOUNDATIONS</b>									
2.1	10' ED Rock BF	6	EA	\$ 358	\$ 2,145	\$ 3,575	\$ 21,450	\$ 3,933	\$ 23,595
2.2	15' ED Rock BF	18	EA	\$ 536	\$ 9,653	\$ 5,363	\$ 96,525	\$ 5,899	\$ 106,178
2.3	20' ED Rock BF	4	EA	\$ 715	\$ 2,860	\$ 7,150	\$ 28,600	\$ 7,865	\$ 31,460
2.4	Foundation – Drilled Pier – 8'X 29'	4	EA	\$ 44,372	\$ 177,487	\$ 44,847	\$ 179,388	\$ 89,219	\$ 356,875
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.11				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.12				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.13				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 192,145		\$ 325,963		\$ 518,108
<b>3. STRUCTURES</b>									
3.1	15kV 3-CKT TANGENT DIST. - WOOD POLE	3	Pole	\$ 3,500	\$ 10,500	\$ 3,600	\$ 10,800	\$ 7,100	\$ 21,300
3.2	15kV 3-CKT MA DIST. - WOOD POLE	1	Pole	\$ 3,500	\$ 3,500	\$ 3,600	\$ 3,600	\$ 7,100	\$ 7,100
3.3	15kV 3-CKT DE - WOOD POLE	2	Pole	\$ 3,500	\$ 7,000	\$ 3,600	\$ 7,200	\$ 7,100	\$ 14,200
3.4	115kV 1-CKT TANGENT - WOOD POLE	5	Pole	\$ 4,500	\$ 22,500	\$ 4,400	\$ 22,000	\$ 8,900	\$ 44,500
3.5	115kV 1-CKT MA - WOOD POLE	2	Pole	\$ 4,500	\$ 9,000	\$ 4,400	\$ 8,800	\$ 8,900	\$ 17,800
3.6	115kV 1-CKT DE - WOOD POLE	11	Pole	\$ 5,500	\$ 60,500	\$ 5,000	\$ 55,000	\$ 10,500	\$ 115,500
3.7	115kV 2-CKT TANGENT - WOOD POLE	4	Pole	\$ 5,500	\$ 22,000	\$ 5,000	\$ 20,000	\$ 10,500	\$ 42,000
3.8	115kV 2-CKT DE - STEEL POLE	4	Pole	\$ 98,883	\$ 395,530	\$ 59,330	\$ 237,318	\$ 158,212	\$ 632,848
3.9	Remove Existing Structure	24	EA		\$ -	\$ 12,300	\$ 295,200	\$ 12,300	\$ 295,200
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12	Install Grounding and Grounding Accessories	32	Pole	\$ 506	\$ 16,192	\$ 5,539	\$ 177,232	\$ 6,045	\$ 193,424
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 546,722		\$ 837,150		\$ 1,383,872
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSR "Cardinal"	23,400	LF	\$ 1.90	\$ 44,460	\$ 5.00	\$ 117,000	\$ 6.90	\$ 161,460
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	7,800	LF	\$ 0.47	\$ 3,666	\$ 5.00	\$ 39,000	\$ 5.47	\$ 42,666
4.5	Remove Existing Cable	6.6	Mile	\$ -	\$ -	\$ 30,000	\$ 197,700	\$ 30,000.00	\$ 197,700
4.6	Remove Existing EH7	2.2	Mile	\$ -	\$ -	\$ 12,000	\$ 26,400	\$ 12,000.00	\$ 26,400
4.7	15kV - (1) 477kcmil 26/7 ACSR "Hawk"	9,630	LF	\$ 1.62	\$ 15,601	\$ 5.00	\$ 48,150	\$ 6.62	\$ 63,751
4.8	15kV - (1) 336kcmil 26/7 ACSR "Linnet"	1,800	LF	\$ 1.22	\$ 2,196	\$ 5.00	\$ 9,000	\$ 6.22	\$ 11,196
4.9		-			\$ -		\$ -		\$ -
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 65,923		\$ 437,250		\$ 503,173
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	115kV Tangent (1-Group of 9-Bells Each Assembly)	33	Assembly	\$ 1,000	\$ 33,000	\$ 560	\$ 18,480	\$ 1,560	\$ 51,480
5.2	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	66	Assembly	\$ 1,000	\$ 66,000	\$ 560	\$ 36,960	\$ 1,560	\$ 102,960
5.3	15kV Tangent	12	Assembly	\$ 100	\$ 1,200	\$ 75	\$ 900	\$ 175	\$ 2,100
5.4	15kV Dead-end & Angle Insulators	18	Assembly	\$ 100	\$ 1,800	\$ 75	\$ 1,350	\$ 175	\$ 3,150
5.5	Neutral, Distribution, Tangent	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.6	Neutral, Distribution, DE/Side	2	Assembly	\$ 100	\$ 200	\$ 75	\$ 150	\$ 175	\$ 350
5.7	Jumper, DE/Angle, 3PH	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.8	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OSHW Assembly - Tangent	11	Assembly	\$ 250	\$ 2,750	\$ 150	\$ 1,650	\$ 400	\$ 4,400
5.10	OHSW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.11	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.12	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.13	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.14	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.16	Guys, Anchors, and Accessories	14.0	EA	\$ 720	\$ 10,080	\$ 885	\$ 12,390	\$ 1,605	\$ 22,470
5.17	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	8	EA	\$ 5,000	\$ 40,000	\$ 5,000	\$ 40,000	\$ 10,000	\$ 80,000
5.20					\$ -		\$ -		\$ -
5.21					\$ -		\$ -		\$ -
5.22					\$ -		\$ -		\$ -
5.23					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 165,730		\$ 118,480		\$ 284,210
<b>N. Interconnection Rotterdam Station</b>					\$ 970,519		\$ 2,951,893		\$ 3,922,412
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 210,473	\$ 210,473	\$ 210,473	\$ 210,473
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 196,121	\$ 196,121	\$ 196,121	\$ 196,121
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 27,457	\$ 27,457	\$ 27,457	\$ 27,457
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 77,642	\$ 77,642	\$ -	\$ -	\$ 77,642	\$ 77,642
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 3,922	\$ 3,922	\$ 3,922	\$ 3,922
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 77,642		\$ 622,679		\$ 700,321

**NAT & NYPA - T026 - (Segment A, Base)**

**System Upgrade Facilities (Various Stations for Edic/Marcy to New Scotland)**

Estimate Revision: **7**

**Total: \$ 6,899,000**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
SUF SS1	Marcy 345kV Bay 3300 - Reconductor Strain Bus UNS-18 Marcy-New Scotland Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 664,560	\$ 665,000
SUF SS1	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 30,000
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 174,000
<b>SUF SS1</b>	<b>SUF SS1 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 869,000</b>
SUF SS2	Marcy 345kV Bay 3100 - Reconductor Strain Bus, Replace (3) breakers and wave trap UE1-7- Marcy-Edic Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 2,946,086	\$ 2,947,000
SUF SS2	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 120,720	\$ 121,000
SUF SS2	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 767,000
<b>SUF SS2</b>	<b>SUFSS 2 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 3,835,000</b>
SUF SS3	Edic 345kV Bay - UE1-7- Marcy-Edic Line Replace (2) breakers and wave trap	1	LS					\$ 1,661,294	\$ 1,662,000
SUF SS3	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 93,120	\$ 94,000
SUF SS3	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 439,000
<b>SUF SS3</b>	<b>SUF SS3 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 2,195,000</b>
SUF SS4		-	LS	\$ -	\$ -	\$ -	\$ -		\$ -
SUF SS4	Removals		LS %					\$ -	\$ -
SUF SS4	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS4</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
SUF SS5		-	LS	\$ -	\$ -	\$ -	\$ -		\$ -
SUF SS5	Removals		LS %					\$ -	\$ -
SUF SS5	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS5</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>STATIONS SUF DIRECT TOTAL:</b>									<b>\$ 5,519,000</b>
<b>STATIONS SUF INDIRECT TOTAL:</b>									<b>\$ 1,380,000</b>
<b>STATIONS SUF TOTAL</b>									<b>\$ 6,899,000</b>

**NAT & NYPA - T026 - (Segment A, Base)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 4.644% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.

NY Power Authority and North American Transmission (T027)			
Description		Total Amount (In thousand \$)	
Direct Cost	1	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$56,801
	1.2	Foundations	\$31,116
	1.3	Structures	\$106,166
	1.4	Conductor, Shieldwire and Optical Ground Wire	\$62,279
	1.5	Insulators, Fitting and Hardwares	\$26,553
	Subtotal (1)		<b>\$282,915</b>
	2	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,340
	2.2	Edic Substation	\$5,333
	2.3	Princetown Substation	\$29,872
	2.4	New Scotland Substation	\$7,717
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,301	
Subtotal (2)		<b>\$100,109</b>	
Total (1+2)		\$383,023	
Contractors Mark-up (15% of Total 1+2)		\$57,453	
Total Direct Cost (A)		<b>\$440,477</b>	
Indirect Cost	3	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$3,830
	3.2	Project Management, Material Handling & Amenities	\$22,218
	3.3	Engineering	\$25,799
	3.4	Testing & Commissioning	\$2,557
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$26,351
	3.6	Compensation for use of NYPA Structures (2 Circuit)	\$17,838
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$8,278
Total Indirect Cost (3)		<b>\$106,872</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$547,348</b>	
4	<b>Network Upgrade Facilities (NUF)</b>		
	4.1	NUF proposed as element of the Project (Marcy and Edic Terminals)	\$7,727
	4.2	NUF identified during Evaluation ( Everett - Wolf Road 115kV Upgrade)	\$5,000
Subtotal NUF Cost (C)		<b>\$12,727</b>	
Total Project Cost (B+C) 2017 \$		<b>\$560,075</b>	
Total Project Cost 2018 \$		<b>\$576,878</b>	

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

Estimate Revision: **8**

<b>NAT &amp; NYPA - T027 - (Segment A, Double Circuit) - Direct Costs</b>		<b>Total Each Segment</b>
Direct Labor, Material & Equipment Costs	A. Transmission Line Edic to Princetown	\$ 192,806,381
Direct Labor, Material & Equipment Costs	B. Transmission Line Princetown to Rotterdam	\$ 20,488,282
Direct Labor, Material & Equipment Costs	C. Transmission Line Princetown to New Scotland	\$ 69,619,908
Direct Labor, Material & Equipment Costs	D. Rotterdam Substation - Install	\$ 44,728,474
Direct Labor, Material & Equipment Costs	E. Rotterdam Substation - Removal	\$ 3,611,030
Direct Labor, Material & Equipment Costs	F. Edic Substation - Install	\$ 5,211,229
Direct Labor, Material & Equipment Costs	G. Edic Substation - Removal	\$ 122,000
Direct Labor, Material & Equipment Costs	H. New Scotland Substation - Install	\$ 7,635,864
Direct Labor, Material & Equipment Costs	I. New Scotland Substation - Removal	\$ 81,300
Direct Labor, Material & Equipment Costs	J. Porter Substation - Install	\$ 71,912
Direct Labor, Material & Equipment Costs	K. Porter Substation - Removal	\$ 474,313
Direct Labor, Material & Equipment Costs	L. Interconnection Edic Station	\$ 1,784,075
Direct Labor, Material & Equipment Costs	M. Interconnection New Scotland Station	\$ 2,594,271
Direct Labor, Material & Equipment Costs	N. Interconnection Rotterdam Station	\$ 3,922,412
Direct Labor, Material & Equipment Costs	O. System Upgrade Facilities (Everett - Wolf Road 115kV Upgrade)	\$ 3,571,500
Direct Labor, Material & Equipment Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 5,519,000
Direct Labor, Material & Equipment Costs	Q. Princetown GIS Substation - Install	\$ 29,871,757
<b>SUBTOTAL:</b>		\$ 392,113,708
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		\$ 58,817,056
<b>CONTINGENCY ON ENTIRE PROJECT</b>		\$ -
<b>TOTAL DIRECT:</b>		\$ 450,930,765

<b>NAT &amp; NYPA - T027 - (Segment A, Double Circuit) - Indirect Costs</b>		<b>Total Each Segment</b>
Indirect Costs	A. Transmission Line Edic to Princetown	\$ 57,168,362
Indirect Costs	B. Transmission Line Princetown to Rotterdam	\$ 4,270,750
Indirect Costs	C. Transmission Line Princetown to New Scotland	\$ 14,220,805
Indirect Costs	D. Rotterdam Substation - Install	\$ 10,456,962
Indirect Costs	E. Rotterdam Substation - Removal	\$ 548,904
Indirect Costs	F. Edic Substation - Install	\$ 1,207,020
Indirect Costs	G. Edic Substation - Removal	\$ 18,423
Indirect Costs	H. New Scotland Substation - Install	\$ 1,746,869
Indirect Costs	I. New Scotland Substation - Removal	\$ 12,277
Indirect Costs	J. Porter Substation - Install	\$ 14,217
Indirect Costs	K. Porter Substation - Removal	\$ 71,625
Indirect Costs	L. Interconnection Edic Station	\$ 320,046
Indirect Costs	M. Interconnection New Scotland Station	\$ 480,828
Indirect Costs	N. Interconnection Rotterdam Station	\$ 638,929
Indirect Costs	O. System Upgrade Facilities (Everett - Wolf Road 115kV Upgrade)	\$ 892,875
Indirect Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 1,380,000
Indirect Costs	Q. Princetown GIS Substation - Install	\$ 7,418,414
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lic. & Permit., and Envir. Mitigation)	\$ 8,277,824
<b>TOTAL INDIRECT:</b>		\$ 109,145,128

<b>TOTAL ESTIMATED COST:</b>		\$ 560,075,893
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**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**A. Transmission Line Edic to Princetown**

Estimate Revision: 8

Total: \$ 249,974,743

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>A. Transmission Line Edic to Princetown</b>			
1. CLEARING & ACCESS	\$ 75,250	\$ 41,489,402	\$ 41,564,652
2. FOUNDATIONS	\$ 3,930,221	\$ 14,264,968	\$ 18,195,189
3. STRUCTURES	\$ 34,672,483	\$ 35,692,215	\$ 70,364,698
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 9,535,493	\$ 34,842,335	\$ 44,377,828
5. INSULATORS, FITTINGS, HARDWARE	\$ 12,595,660	\$ 5,708,354	\$ 18,304,014
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 4,864,729	\$ 52,303,633	\$ 57,168,362
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 65,673,835</b>	<b>\$ 184,300,907</b>	<b>\$ 249,974,743</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 65,673,835</b>	<b>\$ 184,300,907</b>	<b>\$ 249,974,743</b>

0.0%

0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Edic to Princetown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	198.0	Acre	\$ -	\$ -	\$ 5,000	\$ 990,000	\$ 5,000	\$ 990,000
1.3	Permanent Access Road	83,001.6	LF	\$ -	\$ -	\$ 45	\$ 3,735,072	\$ 45	\$ 3,735,072
1.4	Silt Fence	415,008	LF	\$ -	\$ -	\$ 4	\$ 1,660,032	\$ 4	\$ 1,660,032
1.5	Matting - Access and ROW	332,006.4	LF	\$ -	\$ -	\$ 70	\$ 23,240,448	\$ 70	\$ 23,240,448
1.6	Matting - To Work Area	29,325	LF	\$ -	\$ -	\$ 70	\$ 2,052,750	\$ 70	\$ 2,052,750
1.7	Snow Removal	78.6	Mile	\$ -	\$ -	\$ 16,000	\$ 1,257,600	\$ 16,000	\$ 1,257,600
1.8	ROW Restoration	78.6	Mile	\$ -	\$ -	\$ 10,000	\$ 786,000	\$ 10,000	\$ 786,000
1.9	Work Pads	1,955,000	SF	\$ -	\$ -	\$ 4	\$ 6,881,600	\$ 4	\$ 6,881,600
1.10	Restoration for Work Pad areas	391,000	SF	\$ -	\$ -	\$ 0.15	\$ 58,650	\$ 0	\$ 58,650
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	50	EA	\$ -	\$ -	\$ 4,580	\$ 229,000	\$ 4,580	\$ 229,000
1.14	Maintenance and Protection of Traffic on Public Roads	100	EA	\$ -	\$ -	\$ 4,130	\$ 413,000	\$ 4,130	\$ 413,000
1.15	Culverts / Misc. Access	55	EA	\$ 750	\$ 41,250	\$ 1,250	\$ 68,750	\$ 2,000	\$ 110,000
1.16	Gates	17	EA	\$ 2,000	\$ 34,000	\$ 2,500	\$ 42,500	\$ 4,500	\$ 76,500
1.17	Concrete Washout Station	40	EA	\$ -	\$ -	\$ 1,850	\$ 74,000	\$ 1,850	\$ 74,000
<b>TOTAL - CLEARING &amp; ACCESS:</b>					<b>\$ 75,250</b>		<b>\$ 41,489,402</b>		<b>\$ 41,564,652</b>
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°)	4	EA	\$ 9,391	\$ 37,565	\$ 63,861	\$ 255,442	\$ 73,252	\$ 293,007
2.2	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	10	EA	\$ 3,622	\$ 36,218	\$ 24,628	\$ 246,279	\$ 28,250	\$ 282,497
2.3	1-CKT 345KV VERTICAL TANGENT (0°-1°)	76	EA	\$ 2,542	\$ 193,221	\$ 17,288	\$ 1,313,899	\$ 19,831	\$ 1,507,120
2.4	2-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	26	EA	\$ 3,845	\$ 99,957	\$ 26,143	\$ 679,708	\$ 29,987	\$ 779,665
2.5	2-CKT 345KV VERTICAL TANGENT (0°-1°)	233	EA	\$ 2,863	\$ 667,021	\$ 19,467	\$ 4,535,741	\$ 22,329	\$ 5,202,762
2.6	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	20	EA	\$ 72,091	\$ 1,441,825	\$ 80,164	\$ 1,603,275	\$ 152,255	\$ 3,045,099
2.7	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	22	EA	\$ 66,110	\$ 1,454,415	\$ 73,512	\$ 1,617,275	\$ 139,622	\$ 3,071,690
2.8	Rock Excavation Adder	2,006.675	CY	\$ -	\$ -	\$ 2,000	\$ 4,013,350	\$ 2,000	\$ 4,013,350
2.9			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.11			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.12			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.13			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.14			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.15			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.16			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.17			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.18			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.19			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.20			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.21			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.22			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.23			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.24			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.26			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.27			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.28			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.29			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.30			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.31									
<b>TOTAL - FOUNDATIONS:</b>					\$ 3,930,221		\$ 14,264,968		\$ 18,195,189
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) 80'	4	Structure	\$ 69,079	\$ 276,316	\$ 41,447	\$ 165,790	\$ 110,526	\$ 442,106
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) 115'-150'	20	Structure	\$ 139,161	\$ 2,783,214	\$ 83,496	\$ 1,669,928	\$ 222,657	\$ 4,453,142
3.3	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) 130'-135'	10	Structure	\$ 87,960	\$ 879,601	\$ 52,776	\$ 527,761	\$ 140,736	\$ 1,407,362
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°) 115'-145'	73	Structure	\$ 57,278	\$ 4,181,283	\$ 34,367	\$ 2,508,770	\$ 91,645	\$ 6,690,053
3.5	1-CKT 345KV VERTICAL TANGENT (0°-1°) HD 130'	2	Structure	\$ 67,026	\$ 134,051	\$ 40,215	\$ 80,431	\$ 107,241	\$ 214,482
3.6	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) 115'-145'	23	Structure	\$ 198,553	\$ 4,566,721	\$ 119,132	\$ 2,740,033	\$ 317,685	\$ 7,306,754
3.7	2-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) 125'-155'	26	Structure	\$ 119,083	\$ 3,096,149	\$ 71,450	\$ 1,857,689	\$ 190,532	\$ 4,953,838
3.8	2-CKT 345KV VERTICAL TANGENT (0°-1°) 115'-155'	233	Structure	\$ 79,628	\$ 18,553,254	\$ 47,777	\$ 11,131,952	\$ 127,404	\$ 29,685,207
3.9	Remove Existing Foundation	50	EA	\$ -	\$ -	\$ 7,500	\$ 375,000	\$ 7,500	\$ 375,000
3.10	Remove Existing Structure and Accessories	994	EA	\$ -	\$ -	\$ 12,500	\$ 12,425,000	\$ 12,500	\$ 12,425,000
3.11	Install Grounding and Grounding Accessories	399	Pole	\$ 506	\$ 201,894	\$ 5,539	\$ 2,209,862	\$ 6,045	\$ 2,411,756
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 34,672,483		\$ 35,692,215		\$ 70,364,698
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	4,563,821	LF	\$ 1.90	\$ 8,671,260	\$ 5.00	\$ 22,819,105	\$ 6.90	\$ 31,490,365
4.2	(1) OPGW 36 Fiber AC-33/38/571	390,298	LF	\$ 1.35	\$ 526,902	\$ 5.00	\$ 1,951,490	\$ 6.35	\$ 2,478,392
4.3	(1) 3/8" EHS7 Steel	371,448	LF	\$ 0.47	\$ 174,581	\$ 5.00	\$ 1,857,240	\$ 5.47	\$ 2,031,821
4.4									
4.5									
4.6									
4.7	Remove Existing Conductor and Accessories	140.0	Mile	\$ -	\$ -	\$ 30,000	\$ 4,200,000	\$ 30,000.00	\$ 4,200,000
4.8	Remove Existing OPGW and Accessories	140.0	Mile	\$ -	\$ -	\$ 12,000	\$ 1,680,000	\$ 12,000.00	\$ 1,680,000
4.9	Remove Existing OHSW and Accessories	140.0	Mile	\$ -	\$ -	\$ 12,000	\$ 1,680,000	\$ 12,000.00	\$ 1,680,000
4.10									
4.11									
4.12									
4.13	Rider Poles (187 Locations)	93	Set	\$ 1,750	\$ 162,750	\$ 3,500	\$ 325,500	\$ 5,250.00	\$ 488,250
4.14	Rider Poles - Relocated	94	Set	\$ -	\$ -	\$ 3,500	\$ 329,000	\$ 3,500.00	\$ 329,000
4.15									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 9,535,493		\$ 34,842,335		\$ 44,377,828
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	3,696	Assembly	\$ 1,800	\$ 6,652,800	\$ 720	\$ 2,661,120	\$ 2,520	\$ 9,313,920

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
5.2	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	1,020	Assembly	\$ 1,800	\$ 1,836,000	\$ 720	\$ 734,400	\$ 2,520	\$ 2,570,400
5.3			Assembly		\$ -		\$ -	\$ -	\$ -
5.4	OPGW Assembly - Tangent	345	Assembly	\$ 200	\$ 69,000	\$ 150	\$ 51,750	\$ 350	\$ 120,750
5.5	OPGW Assembly - Angle / DE	92	Assembly	\$ 250	\$ 23,000	\$ 150	\$ 13,800	\$ 400	\$ 36,800
5.6	OHSW Assembly - Tangent	259	Assembly	\$ 200	\$ 51,800	\$ 150	\$ 38,850	\$ 350	\$ 90,650
5.7	OHSW Assembly - Angle / DE	44	Assembly	\$ 250	\$ 11,000	\$ 150	\$ 6,600	\$ 400	\$ 17,600
5.8	OPGW Splice Boxes	27	Assembly	\$ 1,746	\$ 47,146	\$ 2,274	\$ 61,398	\$ 4,020	\$ 108,544
5.9	OPGW Splice & Test	27	EA	\$ 2,520	\$ 68,040	\$ 2,520	\$ 68,040	\$ 5,040	\$ 136,080
5.10	Spacer - Conductor	21,901	EA	\$ 50	\$ 1,095,050	\$ 35	\$ 766,535	\$ 85	\$ 1,861,585
5.11	Vibration Dampers - Conductor	4,692	EA	\$ 35	\$ 164,220	\$ 35	\$ 164,220	\$ 70	\$ 328,440
5.12	Shield wire / OPGW Dampers, Misc. Fittings	784	EA	\$ 27	\$ 21,168	\$ 35	\$ 27,440	\$ 62	\$ 48,608
5.13	Jumpers at Existing Structures (New Cable to Existing)	3	EA	\$ 25,000	\$ 75,000	\$ 25,000	\$ 75,000	\$ 50,000	\$ 150,000
5.14	Replace - Mono Pole Vertical Tangent (1-Group of 18-Bells Each Assembly)	960	Assembly	\$ 1,800	\$ 1,728,000	\$ 720	\$ 691,200	\$ 2,520	\$ 2,419,200
5.15	Replace - Dead-end & Angle Insulators (1, Group of 18-Bells Each Assembly)	390	Assembly	\$ 1,800	\$ 702,000	\$ 720	\$ 280,800	\$ 2,520	\$ 982,800
5.16	Guys, Anchors, and Accessories	-	EA	\$ 719	\$ -	\$ 883	\$ -	\$ 1,602	\$ -
5.17	Misc. materials (Signs and Markers)	66.8	Mile	\$ 770	\$ 51,436	\$ 1,006	\$ 67,201	\$ 1,776	\$ 118,637
5.18									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 12,595,660		\$ 5,708,354		\$ 18,304,014
<b>A. Transmission Line Edic to Princetown</b>					\$ 60,809,107		\$ 131,997,274		\$ 192,806,381
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,928,064	\$ 1,928,064	\$ 1,928,064	\$ 1,928,064
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 7,328,089	\$ 7,328,089	\$ 7,328,089	\$ 7,328,089
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,928,064	\$ 1,928,064	\$ 1,928,064	\$ 1,928,064
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,928,064	\$ 1,928,064	\$ 1,928,064	\$ 1,928,064
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 9,640,319	\$ 9,640,319	\$ 9,640,319	\$ 9,640,319
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 578,419	\$ 578,419	\$ 578,419	\$ 578,419
6.7	Geotech	67	Location	\$ -	\$ -	\$ 3,500	\$ 234,500	\$ 3,500	\$ 234,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 1,349,645	\$ 1,349,645	\$ 1,349,645	\$ 1,349,645
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 578,419	\$ 578,419	\$ 578,419	\$ 578,419
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 8,739,000	\$ 8,739,000	\$ 8,739,000	\$ 8,739,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Compensation for use of 2 Ckts - NYPA Structures (92 Structures)	1	LS	\$ -	\$ -	\$ 17,838,245	\$ 17,838,245	\$ 17,838,245	\$ 17,838,245
6.18	Sales Tax on Materials	1	LS	\$ 4,864,729	\$ 4,864,729	\$ -	\$ -	\$ 4,864,729	\$ 4,864,729
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 192,806	\$ 192,806	\$ 192,806	\$ 192,806
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 4,864,729		\$ 52,303,633		\$ 57,168,362

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**B. Transmission Line Princetown to Rotterdam**

Estimate Revision: **8** Total: \$ **24,759,032**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>B. Transmission Line Princetown to Rotterdam</b>			
1. CLEARING & ACCESS	\$ 6,000	\$ 3,038,200	\$ 3,044,200
2. FOUNDATIONS	\$ 417,002	\$ 3,778,708	\$ 4,195,711
3. STRUCTURES	\$ 3,876,135	\$ 4,280,943	\$ 8,157,078
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 722,365	\$ 2,620,705	\$ 3,343,070
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,199,031	\$ 549,192	\$ 1,748,223
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 497,643	\$ 3,773,107	\$ 4,270,750
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 6,718,177	\$ 18,040,855	\$ 24,759,032
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 6,718,177	\$ 18,040,855	\$ 24,759,032

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Princetown to Rotterdam</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	24.0	Acre	\$ -	\$ -	\$ 5,000	\$ 120,000	\$ 5,000	\$ 120,000
1.3	Access Road	5,280	LF	\$ -	\$ -	\$ 45	\$ 237,600	\$ 45	\$ 237,600
1.4	Silt Fence	26,400	LF	\$ -	\$ -	\$ 4	\$ 105,600	\$ 4	\$ 105,600
1.5	Matting - Access and ROW	21,120	LF	\$ -	\$ -	\$ 70	\$ 1,478,400	\$ 70	\$ 1,478,400
1.6	Matting - To Work Area	2,775	LF	\$ -	\$ -	\$ 70	\$ 194,250	\$ 70	\$ 194,250
1.7	Snow Removal	5	Mile	\$ -	\$ -	\$ 16,000	\$ 80,000	\$ 16,000	\$ 80,000
1.8	ROW Restoration	5	Mile	\$ -	\$ -	\$ 10,000	\$ 50,000	\$ 10,000	\$ 50,000
1.9	Work Pads	185,000	SF	\$ -	\$ -	\$ 4	\$ 651,200	\$ 4	\$ 651,200
1.10	Restoration for Work Pad areas	37,000	SF	\$ -	\$ -	\$ 0.2	\$ 5,550	\$ 0	\$ 5,550
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	10	EA	\$ -	\$ -	\$ 4,580	\$ 45,800	\$ 4,580	\$ 45,800
1.14	Maintenance and Protection of Traffic on Public Roads	10	EA	\$ -	\$ -	\$ 4,130	\$ 41,300	\$ 4,130	\$ 41,300
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 6,000		\$ 3,038,200		\$ 3,044,200
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 6' x 18'	56	EA	\$ 1,857	\$ 104,018	\$ 18,603	\$ 1,041,794	\$ 20,461	\$ 1,145,812
2.2	Direct Embed Foundations - 6' x 20'	4	EA	\$ 2,046	\$ 8,185	\$ 20,562	\$ 82,247	\$ 22,608	\$ 90,432
2.3	Direct Embed Foundations - 6' x 22'	8	EA	\$ 2,235	\$ 17,880	\$ 22,520	\$ 180,160	\$ 24,755	\$ 198,040
2.4	Direct Embed Foundations - 7' x 25'	4	EA	\$ 3,105	\$ 12,422	\$ 34,650	\$ 138,601	\$ 37,756	\$ 151,023
2.5	Drilled Pier - 6' x 19'	6	EA	\$ 17,204	\$ 103,223	\$ 17,391	\$ 104,347	\$ 34,595	\$ 207,570
2.6	Drilled Pier - 8' x 27'	4	EA	\$ 42,819	\$ 171,274	\$ 57,340	\$ 229,359	\$ 100,158	\$ 400,633
2.7	Rock Excavation Adder	1,001.1	CY	\$ -	\$ -	\$ 2,000	\$ 2,002,200	\$ 2,000	\$ 2,002,200
<b>TOTAL - FOUNDATIONS:</b>					\$ 417,002		\$ 3,778,708		\$ 4,195,711
<b>3. STRUCTURES</b>									
3.1	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 115'	24	Structure	\$ 85,544	\$ 2,053,056	\$ 51,326	\$ 1,231,834	\$ 136,870	\$ 3,284,890
3.2	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 135'	2	Structure	\$ 106,005	\$ 212,010	\$ 63,603	\$ 127,206	\$ 169,608	\$ 339,216
3.3	2x 1-CKT 345KV DELTA SMALL ANGLE (1°-15°) - 115'	2	Structure	\$ 141,673	\$ 283,346	\$ 85,004	\$ 170,008	\$ 226,677	\$ 453,354
3.4	2x 1-CKT 345KV VERTICAL TANGENT DEADEND (0°-5°) - 115'	4	Structure	\$ 109,816	\$ 439,264	\$ 65,890	\$ 263,558	\$ 175,706	\$ 702,822
3.5	2x 1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	2	Structure	\$ 232,656	\$ 465,312	\$ 139,594	\$ 279,187	\$ 372,250	\$ 744,499
3.6	2x 1-CKT 345KV 3-POLE LARGE ANGLE DEADEND (60°-90°) - 115'	1	Structure	\$ 176,342	\$ 176,342	\$ 105,805	\$ 105,805	\$ 282,147	\$ 282,147
3.7	2x 1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 65'	1	Structure	\$ 99,493	\$ 99,493	\$ 59,696	\$ 59,696	\$ 159,189	\$ 159,189

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.8	2x 1-CKT 345KV DELTA TANGENT (0°-1°) HD- 115'	1	Structure	\$ 105,820	\$ 105,820	\$ 63,492	\$ 63,492	\$ 169,312	\$ 169,312
3.9	Remove Existing Foundation	22	EA	\$ -	\$ -	\$ 7,500	\$ 163,500	\$ 7,500	\$ 163,500
3.10	Remove Existing Structure and Accessories	109	EA	\$ -	\$ -	\$ 12,500	\$ 1,362,500	\$ 12,500	\$ 1,362,500
3.11	Install Grounding and Grounding Accessories	82	Pole	\$ 506	\$ 41,492	\$ 5,539	\$ 454,157	\$ 6,045	\$ 495,649
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 3,876,135		\$ 4,280,943		\$ 8,157,078
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal" (R1 - R36)	339,293	LF	\$ 1.90	\$ 644,657	\$ 5.00	\$ 1,696,465	\$ 6.90	\$ 2,341,122
4.2	(1) OPGW 36 Fiber AC-33/38/571 (R1 - R36)	28,274	LF	\$ 1.35	\$ 38,170	\$ 5.00	\$ 141,370	\$ 6.35	\$ 179,540
4.3	(1) 3/8" EHS7 Steel (R1 - R36)	28,274	LF	\$ 0.47	\$ 13,289	\$ 5.00	\$ 141,370	\$ 5.47	\$ 154,659
4.5	Remove Existing Conductor and Accessories	10.0	Mile	\$ -	\$ -	\$ 30,000	\$ 300,000	\$ 30,000.00	\$ 300,000
4.6	Remove Existing OPGW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.7	Remove Existing OHSW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.8	Rider Poles	15	EA	\$ 1,750	\$ 26,250	\$ 3,500	\$ 52,500	\$ 5,250.00	\$ 78,750
4.9	Rider Poles - Relocated	14	Set	\$ -	\$ -	\$ 3,500	\$ 49,000	\$ 3,500.00	\$ 49,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 722,365		\$ 2,620,705		\$ 3,343,070
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345KV Tangent (1-Group of 18-Bells Each Assembly)	348	Assembly	\$ 1,800	\$ 626,400	\$ 720	\$ 250,560	\$ 2,520	\$ 876,960
5.2	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	240	Assembly	\$ 1,800	\$ 432,000	\$ 720	\$ 172,800	\$ 2,520	\$ 604,800
5.3	OPGW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.4	OPGW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.5	OHSW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.6	OHSW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.7	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.8	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.9	Spacer - Conductor	1,002	EA	\$ 50	\$ 50,100	\$ 35	\$ 35,070	\$ 85	\$ 85,170
5.10	Vibration Dampers - Conductor	852	EA	\$ 35	\$ 29,820	\$ 35	\$ 29,820	\$ 70	\$ 59,640
5.11	Shieldwire / OPGW Dampers, Misc. Fittings	116	EA	\$ 27	\$ 3,132	\$ 35	\$ 4,060	\$ 62	\$ 7,192
5.12	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.13	Misc. materials (Signs and Markers)	5.0	Mile	\$ 770	\$ 3,850	\$ 1,006	\$ 5,030	\$ 1,776	\$ 8,880
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,199,031		\$ 549,192		\$ 1,748,223
<b>B. Transmission Line Princetown to Rotterdam</b>					\$ 6,220,534		\$ 14,267,748		\$ 20,488,282
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 778,708	\$ 778,708	\$ 778,708	\$ 778,708
6.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.7	Geotech	5	Location	\$ -	\$ -	\$ 3,500	\$ 17,500	\$ 3,500	\$ 17,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 143,418	\$ 143,418	\$ 143,418	\$ 143,418
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.18	Sales Tax on Materials	1	LS	\$ 497,643	\$ 497,643	\$ -	\$ -	\$ 497,643	\$ 497,643
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 20,488	\$ 20,488	\$ 20,488	\$ 20,488
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 497,643		\$ 3,773,107		\$ 4,270,750

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**C. Transmission Line Princetown to New Scotland**

Estimate Revision: 8

Total: \$ 83,840,713

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>C. Transmission Line Princetown to New Scotland</b>			
1. CLEARING & ACCESS	\$ 31,000	\$ 12,160,694	\$ 12,191,694
2. FOUNDATIONS	\$ 1,906,579	\$ 6,818,398	\$ 8,724,977
3. STRUCTURES	\$ 14,926,511	\$ 12,717,400	\$ 27,643,911
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,406,079	\$ 11,152,295	\$ 14,558,374
5. INSULATORS, FITTINGS, HARDWARE	\$ 4,435,513	\$ 2,065,439	\$ 6,500,952
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,976,455	\$ 12,244,350	\$ 14,220,805
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 26,682,137</b>	<b>\$ 57,158,576</b>	<b>\$ 83,840,713</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 26,682,137</b>	<b>\$ 57,158,576</b>	<b>\$ 83,840,713</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	64.0	Acre	\$ -	\$ -	\$ 5,000	\$ 320,000	\$ 5,000	\$ 320,000
1.3	Permanent Access Road	20,803.2	LF	\$ -	\$ -	\$ 45	\$ 936,144	\$ 45	\$ 936,144
1.4	Silt Fence	104,016.0	LF	\$ -	\$ -	\$ 4	\$ 416,064	\$ 4	\$ 416,064
1.5	Matting - Access and ROW	83,212.8	LF	\$ -	\$ -	\$ 70	\$ 5,824,896	\$ 70	\$ 5,824,896
1.6	Matting - To Work Area	12,450	LF	\$ -	\$ -	\$ 70	\$ 871,500	\$ 70	\$ 871,500
1.7	Snow Removal	19.7	Mile	\$ -	\$ -	\$ 16,000	\$ 315,200	\$ 16,000	\$ 315,200
1.8	ROW Restoration	19.7	Mile	\$ -	\$ -	\$ 10,000	\$ 197,000	\$ 10,000	\$ 197,000
1.9	Work Pads	830,000	SF	\$ -	\$ -	\$ 4	\$ 2,921,600	\$ 4	\$ 2,921,600
1.10	Restoration for Work Pad areas	166,000	SF	\$ -	\$ -	\$ 0.2	\$ 24,900	\$ 0	\$ 24,900
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	2	EA	\$ -	\$ -	\$ 14,445	\$ 28,890	\$ 14,445	\$ 28,890
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	50	EA	\$ -	\$ -	\$ 4,130	\$ 206,500	\$ 4,130	\$ 206,500
1.15	Gates	11	EA	\$ 2,000	\$ 22,000	\$ 2,500	\$ 27,500	\$ 4,500	\$ 49,500
1.16	Culverts / Misc. Access	12	EA	\$ 750	\$ 9,000	\$ 1,250	\$ 15,000	\$ 2,000	\$ 24,000
1.17	Concrete Washout Station	30	EA	\$ -	\$ -	\$ 1,850	\$ 55,500	\$ 1,850	\$ 55,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 31,000		\$ 12,160,694		\$ 12,191,694
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	2	EA	\$ 4,993	\$ 9,985	\$ 33,950	\$ 67,900	\$ 38,942	\$ 77,885
2.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	33	EA	\$ 4,364	\$ 144,020	\$ 29,677	\$ 979,338	\$ 34,041	\$ 1,123,358
2.3	2-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	7	EA	\$ 3,880	\$ 27,162	\$ 26,386	\$ 184,700	\$ 30,266	\$ 211,862
2.4	2-CKT 345KV VERTICAL TANGENT (0°-1°)	105	EA	\$ 2,848	\$ 299,001	\$ 19,364	\$ 2,033,204	\$ 22,211	\$ 2,332,205
2.5	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	3	EA	\$ 58,386	\$ 175,157	\$ 64,912	\$ 194,736	\$ 123,297	\$ 369,892
2.6	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	16	EA	\$ 78,203	\$ 1,251,255	\$ 86,945	\$ 1,391,121	\$ 165,148	\$ 2,642,376
2.7	Rock Excavation Adder	983.7	CY	\$ -	\$ -	\$ 2,000	\$ 1,967,400	\$ 2,000	\$ 1,967,400
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.16									
2.17									
2.18									
2.19									
2.20									
2.21									
2.22									
2.23									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,906,579		\$ 6,818,398		\$ 8,724,977
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) 115'	3	Structure	\$ 116,328	\$ 348,984	\$ 69,797	\$ 209,390	\$ 186,125	\$ 558,374
3.2	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) 130'	2	Structure	\$ 85,082	\$ 170,163	\$ 51,049	\$ 102,098	\$ 136,130	\$ 272,261
3.3	1-CKT 345KV VERTICAL TANGENT (0°-1°) 115'-135'	33	Structure	\$ 56,569	\$ 1,866,787	\$ 33,942	\$ 1,120,072	\$ 90,511	\$ 2,986,859
3.4	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) 115'-145'	16	Structure	\$ 201,043	\$ 3,216,691	\$ 120,626	\$ 1,930,015	\$ 321,669	\$ 5,146,706
3.5	2-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) 115'-165'	7	Structure	\$ 124,542	\$ 871,794	\$ 74,725	\$ 523,076	\$ 199,267	\$ 1,394,870
3.6	2-CKT 345KV VERTICAL TANGENT (0°-1°) 115'-145'	105	Structure	\$ 79,696	\$ 8,368,096	\$ 47,818	\$ 5,020,857	\$ 127,514	\$ 13,388,953
3.7	Remove Existing Foundation	124	EA	\$ -	\$ -	\$ 7,500	\$ 930,000	\$ 7,500	\$ 930,000
3.8	Remove Existing Lattice Structure and Accessories	30	EA	\$ -	\$ -	\$ 12,500	\$ 375,000	\$ 12,500	\$ 375,000
3.9	Remove Existing Structure and Accessories	127	EA	\$ -	\$ -	\$ 12,500	\$ 1,587,500	\$ 12,500	\$ 1,587,500
3.10	Install Grounding and Grounding Accessories	166	Pole	\$ 506	\$ 83,996	\$ 5,539	\$ 919,391	\$ 6,045	\$ 1,003,387
3.11									
<b>TOTAL - STRUCTURES:</b>					\$ 14,926,511		\$ 12,717,400		\$ 27,643,911
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal"	1,533,470	LF	\$ 1.90	\$ 2,913,593	\$ 5.00	\$ 7,667,350	\$ 6.90	\$ 10,580,943
4.2	(1) OPGW 36 Fiber AC-33/38/571	255,578	LF	\$ 1.35	\$ 345,030	\$ 5.00	\$ 1,277,890	\$ 6.35	\$ 1,622,920
4.3	(1) 3/8" EHS7 Steel	220,651	LF	\$ 0.47	\$ 103,706	\$ 5.00	\$ 1,103,255	\$ 5.47	\$ 1,206,961
4.4	Remove Existing Conductor and Accessories	17.2	Mile	\$ -	\$ -	\$ 30,000	\$ 516,000	\$ 30,000.00	\$ 516,000
4.5	Remove Existing OPGW and Accessories	17.2	Mile	\$ -	\$ -	\$ 12,000	\$ 206,400	\$ 12,000.00	\$ 206,400
4.6	Remove Existing OHSW and Accessories	17.2	Mile	\$ -	\$ -	\$ 12,000	\$ 206,400	\$ 12,000.00	\$ 206,400
4.7	115KV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.8	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.9	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.10	Rider Poles (50 Locations)	25	EA	\$ 1,750	\$ 43,750	\$ 3,500	\$ 87,500	\$ 5,250.00	\$ 131,250
4.11	Rider Poles - Relocated	25	Set	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500.00	\$ 87,500
4.12									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,406,079		\$ 11,152,295		\$ 14,558,374
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	1,554	Assembly	\$ 1,800	\$ 2,797,200	\$ 720	\$ 1,118,880	\$ 2,520	\$ 3,916,080
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345KV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	525	Assembly	\$ 1,800	\$ 945,000	\$ 720	\$ 378,000	\$ 2,520	\$ 1,323,000
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	147	Assembly	\$ 200	\$ 29,400	\$ 150	\$ 22,050	\$ 350	\$ 51,450
5.6	OPGW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.7	OHSW Assembly - Tangent	112	Assembly	\$ 200	\$ 22,400	\$ 150	\$ 16,800	\$ 350	\$ 39,200
5.8	OHSW Assembly - Angle / DE	32	Assembly	\$ 250	\$ 8,000	\$ 150	\$ 4,800	\$ 400	\$ 12,800
5.9	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.10	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.11	Spacer - Conductor	8,395	EA	\$ 50	\$ 419,750	\$ 35	\$ 293,825	\$ 85	\$ 713,575
5.12	Vibration Dampers - Conductor	1,536	EA	\$ 35	\$ 53,760	\$ 35	\$ 53,760	\$ 70	\$ 107,520
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	293	EA	\$ 27	\$ 7,911	\$ 35	\$ 10,255	\$ 62	\$ 18,166
5.14	Guys, Anchors, and Accessories	60.0	EA	\$ 719	\$ 43,140	\$ 883	\$ 52,997	\$ 1,602	\$ 96,137
5.15	Misc. materials (Signs and Markers)	19.9	Mile	\$ 770	\$ 15,323	\$ 1,006	\$ 20,019	\$ 1,776	\$ 35,342
5.16	Jumpers at Existing Structures (New Cable to Existing)	2	EA	\$ 25,000	\$ 50,000	\$ 25,000	\$ 50,000	\$ 50,000	\$ 100,000
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 4,435,513		\$ 2,065,439		\$ 6,500,952
<b>C. Transmission Line Princetown to New Scotland</b>					\$ 24,705,683		\$ 44,914,226		\$ 69,619,908
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 696,199	\$ 696,199	\$ 696,199	\$ 696,199
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,646,079	\$ 2,646,079	\$ 2,646,079	\$ 2,646,079
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 696,199	\$ 696,199	\$ 696,199	\$ 696,199
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 696,199	\$ 696,199	\$ 696,199	\$ 696,199
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,480,995	\$ 3,480,995	\$ 3,480,995	\$ 3,480,995
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 208,860	\$ 208,860	\$ 208,860	\$ 208,860
6.7	Geotech	20	Location	\$ -	\$ -	\$ 3,500	\$ 70,000	\$ 3,500	\$ 70,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 487,339	\$ 487,339	\$ 487,339	\$ 487,339
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 208,860	\$ 208,860	\$ 208,860	\$ 208,860
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 147,000	\$ 147,000	\$ 147,000	\$ 147,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,797,000	\$ 2,797,000	\$ 2,797,000	\$ 2,797,000
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,976,455	\$ 1,976,455	\$ -	\$ -	\$ 1,976,455	\$ 1,976,455
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 69,620	\$ 69,620	\$ 69,620	\$ 69,620
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,976,455		\$ 12,244,350		\$ 14,220,805

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**D. Rotterdam Substation - Install**

Estimate Revision: **8** Total: \$ **55,185,436**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>D. Rotterdam Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,896,891	\$ 8,763,755	\$ 11,660,646
2. SUBSTATION FOUNDATIONS	\$ 2,443,003	\$ 2,616,200	\$ 5,059,203
3. SUBSTATION STRUCTURES	\$ 944,980	\$ 944,980	\$ 1,889,960
4. MAJOR EQUIPMENT	\$ 11,915,000	\$ 2,970,000	\$ 14,885,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,994,540	\$ 1,060,500	\$ 3,055,040
6. CONTROL HOUSE / PANELS	\$ 2,927,500	\$ 1,477,500	\$ 4,405,000
7. MISC ITEMS	\$ 1,441,675	\$ 2,331,950	\$ 3,773,625
8. MOB/DEMOP, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,965,087	\$ 8,491,875	\$ 10,456,962
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 26,528,676</b>	<b>\$ 28,656,759</b>	<b>\$ 55,185,436</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 26,528,676</b>	<b>\$ 28,656,759</b>	<b>\$ 55,185,436</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Rotterdam Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	7.4	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,497,125	\$ 203,000	\$ 1,497,125
1.2	Station stone within substation fence.	3,175	CY	\$ 27	\$ 85,725	\$ 75	\$ 238,125	\$ 102	\$ 323,850
1.3	Substation Fence	2,130	LF	\$ 100	\$ 213,000	\$ 100	\$ 213,000	\$ 200	\$ 426,000
1.4	Retaining Wall (1065' x 13')	1	LS	\$ 406,755	\$ 406,755	\$ 925,345	\$ 925,345	\$ 1,332,100	\$ 1,332,100
1.5	Compacted Fill (124,583cy Sand)	124,583	CY	\$ 17	\$ 2,117,911	\$ 20	\$ 2,491,660	\$ 37	\$ 4,609,571
1.6	Permanent Access Road - 20'-Wide (From Gordon RD)	2,100	LF	\$ 35	\$ 73,500	\$ 285	\$ 598,500	\$ 320	\$ 672,000
1.7	Natural Gas Transmission Line Relocation	1	LS	\$ -		\$ 2,800,000	\$ 2,800,000	\$ 2,800,000	\$ 2,800,000
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,896,891		\$ 8,763,755		\$ 11,660,646
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	8	EA	\$ 14,940	\$ 119,520	\$ 16,000	\$ 128,000	\$ 30,940	\$ 247,520
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	32	EA	\$ 26,145	\$ 836,640	\$ 28,000	\$ 896,000	\$ 54,145	\$ 1,732,640
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	102	EA	\$ 4,482	\$ 457,164	\$ 4,800	\$ 489,600	\$ 9,282	\$ 946,764
2.1f	Station Service Transformer Stand Foundation	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	42	EA	\$ 4,482	\$ 188,244	\$ 4,800	\$ 201,600	\$ 9,282	\$ 389,844
2.1j	Instrument Transformer Stand Foundations	33	EA	\$ 4,482	\$ 147,906	\$ 4,800	\$ 158,400	\$ 9,282	\$ 306,306
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	1	EA	\$ 11,952	\$ 11,952	\$ 12,800	\$ 12,800	\$ 24,752	\$ 24,752
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 22,410	\$ 89,640	\$ 24,000	\$ 96,000	\$ 46,410	\$ 185,640
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	8	EA	\$ 3,735	\$ 29,880	\$ 4,000	\$ 32,000	\$ 7,735	\$ 61,880
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	9	EA	\$ 3,735	\$ 33,615	\$ 4,000	\$ 36,000	\$ 7,735	\$ 69,615
2.2k	Arrester Stand Foundations	3	EA	\$ 3,735	\$ 11,205	\$ 4,000	\$ 12,000	\$ 7,735	\$ 23,205
2.2m	Wave Trap Stand Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 16,434	\$ 65,736	\$ 17,600	\$ 70,400	\$ 34,034	\$ 136,136
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.4b	345-115kV Transformer Foundation w/ Oil Containment	2	EA	\$ 74,700	\$ 149,400	\$ 80,000	\$ 160,000	\$ 154,700	\$ 309,400
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 2,443,003		\$ 2,616,200		\$ 5,059,203
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1a	Substation A-Frame Structures - Stand alone	8	EA	\$ 37,000	\$ 296,000	\$ 37,000	\$ 296,000	\$ 74,000	\$ 592,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	17	EA	\$ 14,800	\$ 251,600	\$ 14,800	\$ 251,600	\$ 29,600	\$ 503,200
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	42	EA	\$ 3,700	\$ 155,400	\$ 3,700	\$ 155,400	\$ 7,400	\$ 310,800
3.1g	Instrument Transformer Stand	33	EA	\$ 1,850	\$ 61,050	\$ 1,850	\$ 61,050	\$ 3,700	\$ 122,100
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ 33,300	\$ 33,300	\$ 33,300	\$ 33,300	\$ 66,600	\$ 66,600
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	2	EA	\$ 12,025	\$ 24,050	\$ 12,025	\$ 24,050	\$ 24,050	\$ 48,100
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	9	EA	\$ 1,295	\$ 11,655	\$ 1,295	\$ 11,655	\$ 2,590	\$ 23,310
3.2h	Arrester Stand	3	EA	\$ 1,295	\$ 3,885	\$ 1,295	\$ 3,885	\$ 2,590	\$ 7,770
3.2j	Wave Trap Stand	1	EA	\$ 5,550	\$ 5,550	\$ 5,550	\$ 5,550	\$ 11,100	\$ 11,100
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	2	EA	\$ 7,955	\$ 15,910	\$ 7,955	\$ 15,910	\$ 15,910	\$ 31,820
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 944,980		\$ 944,980		\$ 1,889,960
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	8	EA	\$ 200,000	\$ 1,600,000	\$ 80,000	\$ 640,000	\$ 280,000	\$ 2,240,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	1	EA	\$ 3,400,000	\$ 3,400,000	\$ 750,000	\$ 750,000	\$ 4,150,000	\$ 4,150,000
4.1d	345 kV - 115 kV Auto Transformer	2	EA	\$ 3,400,000	\$ 6,800,000	\$ 750,000	\$ 1,500,000	\$ 4,150,000	\$ 8,300,000
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	1	EA	\$ 115,000	\$ 115,000	\$ 80,000	\$ 80,000	\$ 195,000	\$ 195,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 11,915,000		\$ 2,970,000		\$ 14,885,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000
5.1b	Disconnect Switches - 3ph w/ manual operator	17	EA	\$ 35,000	\$ 595,000	\$ 17,500	\$ 297,500	\$ 52,500	\$ 892,500
5.1c	VT'S	6	EA	\$ 25,000	\$ 150,000	\$ 12,000	\$ 72,000	\$ 37,000	\$ 222,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	21	EA	\$ 13,000	\$ 273,000	\$ 8,000	\$ 168,000	\$ 21,000	\$ 441,000
5.1f	Arresters	15	EA	\$ 6,500	\$ 97,500	\$ 1,500	\$ 22,500	\$ 8,000	\$ 120,000
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j		0	EA	\$ 15,000	\$ -	\$ 7,500	\$ -	\$ 22,500	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	1	EA	\$ 35,000	\$ 35,000	\$ 15,000	\$ 15,000	\$ 50,000	\$ 50,000
5.2b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 30,000	\$ 30,000	\$ 17,500	\$ 17,500	\$ 47,500	\$ 47,500
5.2c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2e	CCVT'S	3	EA	\$ 10,000	\$ 30,000	\$ 6,000	\$ 18,000	\$ 16,000	\$ 48,000
5.2f	Arresters	6	EA	\$ 5,000	\$ 30,000	\$ 6,000	\$ 36,000	\$ 11,000	\$ 66,000
5.2g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	2	EA	\$ 8,000	\$ 16,000	\$ 8,000	\$ 16,000	\$ 16,000	\$ 32,000
5.3f	Arresters	12	EA	\$ 3,420	\$ 41,040	\$ 6,000	\$ 72,000	\$ 9,420	\$ 113,040
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,994,540		\$ 1,060,500		\$ 3,055,040
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 975,000	\$ 975,000	\$ 170,000	\$ 170,000	\$ 1,145,000	\$ 1,145,000
6.2	Protection and Telecom Equipment Panels	29	EA	\$ 35,000	\$ 1,015,000	\$ 10,000	\$ 290,000	\$ 45,000	\$ 1,305,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 472,500	\$ 472,500	\$ 472,500	\$ 472,500	\$ 945,000	\$ 945,000
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,927,500		\$ 1,477,500		\$ 4,405,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,950	LF	\$ 185.00	\$ 360,750	\$ 170.00	\$ 331,500	\$ 355	\$ 692,250
7.2	Rigid Bus, Fittings & Insulators	2,500	LF	\$ 125.07	\$ 312,675	\$ 237.10	\$ 592,750	\$ 362	\$ 905,425
7.3	Strain Bus, Connectors & Insulators	2,000	LF	\$ 39.30	\$ 78,600	\$ 53.35	\$ 106,700	\$ 93	\$ 185,300
7.4	Grounding System	25,000	LF	\$ 6.93	\$ 173,250	\$ 32.58	\$ 814,500	\$ 40	\$ 987,750
7.5	Strain Bus Insulators - 345kV	48	EA	\$ 2,000	\$ 96,000	\$ 1,050	\$ 50,400	\$ 3,050	\$ 146,400
7.6	Strain Bus Insulators - 230kV	6	EA	\$ 1,400	\$ 8,400	\$ 750	\$ 4,500	\$ 2,150	\$ 12,900
7.7	Strain Bus Insulators - 115kV	12	EA	\$ 1,000	\$ 12,000	\$ 550	\$ 6,600	\$ 1,550	\$ 18,600
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
<b>TOTAL - MISC ITEMS</b>					\$ 1,441,675		\$ 2,331,950		\$ 3,773,625
<b>D. Rotterdam Substation - Install</b>					\$ 24,563,589		\$ 20,164,885		\$ 44,728,474
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,700,017	\$ 1,700,017	\$ 1,700,017	\$ 1,700,017
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,578,278	\$ 3,578,278	\$ 3,578,278	\$ 3,578,278
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 313,099	\$ 313,099	\$ 313,099	\$ 313,099
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,118,212	\$ 1,118,212	\$ 1,118,212	\$ 1,118,212
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 134,185	\$ 134,185	\$ 134,185	\$ 134,185

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 247,500	\$ 247,500	\$ 247,500	\$ 247,500
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,965,087	\$ 1,965,087	\$ -	\$ -	\$ 1,965,087	\$ 1,965,087
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 44,728	\$ 44,728	\$ 44,728	\$ 44,728
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,965,087		\$ 8,491,875		\$ 10,456,962

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**E. Rotterdam Substation - Removal**

Estimate Revision: **8** Total: \$ **4,159,934**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>E. Rotterdam Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 1,472,750	\$ 1,472,750
2. SUBSTATION FOUNDATIONS	\$ -	\$ 617,400	\$ 617,400
3. SUBSTATION STRUCTURES	\$ -	\$ 534,900	\$ 534,900
4. MAJOR EQUIPMENT	\$ -	\$ 147,000	\$ 147,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 169,500	\$ 169,500
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 519,480	\$ 519,480
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 548,904	\$ 548,904
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 4,159,934	\$ 4,159,934
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 4,159,934	\$ 4,159,934

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>E. Rotterdam Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	6.3	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,268,750	\$ 203,000	\$ 1,268,750
1.2	Station stone within substation fence.	2,000	CY	\$ -	\$ -	\$ 102	\$ 204,000	\$ 102	\$ 204,000
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 1,472,750		\$ 1,472,750
<b>2. SUBSTATION FOUNDATIONS</b>									
2.1	<b>345kV</b>								
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	9	EA	\$ -	\$ -	\$ 7,200	\$ 64,800	\$ 7,200	\$ 64,800
2.2b	Capacitor Bank Foundations	2	EA	\$ -	\$ -	\$ 32,000	\$ 64,000	\$ 32,000	\$ 64,000
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	1	EA	\$ -	\$ -	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	15	EA	\$ -	\$ -	\$ 5,200	\$ 78,000	\$ 5,200	\$ 78,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	4	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	59	EA	\$ -	\$ -	\$ 2,400	\$ 141,600	\$ 2,400	\$ 141,600
2.2j	Instrument Transformer Stand Foundations	15	EA	\$ -	\$ -	\$ 2,400	\$ 36,000	\$ 2,400	\$ 36,000
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	3	EA	\$ -	\$ -	\$ 42,000	\$ 126,000	\$ 42,000	\$ 126,000
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 617,400		\$ 617,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ -	\$ -	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	15	EA	\$ -	\$ -	\$ 9,750	\$ 146,250	\$ 9,750	\$ 146,250
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	4	EA	\$ -	\$ -	\$ 2,250	\$ 9,000	\$ 2,250	\$ 9,000
3.2f	Bus Support 1 Ph	59	EA	\$ -	\$ -	\$ 2,250	\$ 132,750	\$ 2,250	\$ 132,750
3.2g	Instrument Transformer Stand	15	EA	\$ -	\$ -	\$ 1,050	\$ 15,750	\$ 1,050	\$ 15,750
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	3	EA	\$ -	\$ -	\$ 4,500	\$ 13,500	\$ 4,500	\$ 13,500
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 534,900		\$ 534,900
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	9	EA	\$ -	\$ -	\$ 7,000	\$ 63,000	\$ 7,000	\$ 63,000
4.2b	Capacitor Banks	2	EA	\$ -	\$ -	\$ 42,000	\$ 84,000	\$ 42,000	\$ 84,000
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 147,000		\$ 147,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2b	Disconnect Switches - 3ph w/ manual operator	12	EA	\$ -	\$ -	\$ 5,500	\$ 66,000	\$ 5,500	\$ 66,000
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	8	EA	\$ -	\$ -	\$ 1,500	\$ 12,000	\$ 1,500	\$ 12,000
5.2f	Arresters	15	EA	\$ -	\$ -	\$ 2,500	\$ 37,500	\$ 2,500	\$ 37,500
5.2g	Wave Traps	3	EA	\$ -	\$ -	\$ 2,500	\$ 7,500	\$ 2,500	\$ 7,500
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 169,500		\$ 169,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	PANELS	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Protection and Telecom Equipment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.2	Rigid Bus, Fittings & Insulators	3,200	LF	\$ -	\$ -	\$ 126.25	\$ 404,000	\$ 126	\$ 404,000
7.3	Strain Bus, Connectors & Insulators	800	LF	\$ -	\$ -	\$ 39.35	\$ 31,480	\$ 39	\$ 31,480
7.4	Grounding System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 519,480		\$ 519,480
<b>E. Rotterdam Substation - Removal</b>					\$ -		\$ 3,611,030		\$ 3,611,030
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS	\$ -	\$ -	\$ 137,246	\$ 137,246	\$ 137,246	\$ 137,246
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 288,882	\$ 288,882	\$ 288,882	\$ 288,882
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 25,277	\$ -	\$ 25,277	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 90,276	\$ -	\$ 90,276	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 10,833	\$ 10,833	\$ 10,833	\$ 10,833
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 3,611	\$ 3,611	\$ 3,611	\$ 3,611
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 548,904		\$ 548,904

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**F. Edic Substation - Install**

Estimate Revision: **8** Total: \$ **6,418,249**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>F. Edic Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 99,300	\$ 396,250	\$ 495,550
2. SUBSTATION FOUNDATIONS	\$ 425,790	\$ 456,000	\$ 881,790
3. SUBSTATION STRUCTURES	\$ 299,700	\$ 299,700	\$ 599,400
4. MAJOR EQUIPMENT	\$ 600,000	\$ 240,000	\$ 840,000
5. SMALL EQUIPMENT / MATERIALS	\$ 645,500	\$ 315,000	\$ 960,500
6. CONTROL HOUSE / PANELS	\$ 313,850	\$ 138,850	\$ 452,700
7. MISC ITEMS	\$ 292,289	\$ 689,000	\$ 981,289
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 214,114	\$ 992,905	\$ 1,207,020
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 2,890,543</b>	<b>\$ 3,527,705</b>	<b>\$ 6,418,249</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 2,890,543</b>	<b>\$ 3,527,705</b>	<b>\$ 6,418,249</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Edic Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	1.25	ACRES	\$ -	\$ -	\$ 203,000	\$ 253,750	\$ 203,000	\$ 253,750
1.2	Station stone within substation fence.	900	CY	\$ 27	\$ 24,300	\$ 75	\$ 67,500	\$ 102	\$ 91,800
1.3	Substation Fence	750	LF	\$ 100	\$ 75,000	\$ 100	\$ 75,000	\$ 200	\$ 150,000
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 99,300		\$ 396,250		\$ 495,550
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	42	EA	\$ 4,482	\$ 188,244	\$ 4,800	\$ 201,600	\$ 9,282	\$ 389,844
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	17	EA	\$ 4,482	\$ 76,194	\$ 4,800	\$ 81,600	\$ 9,282	\$ 157,794
2.1j	Instrument Transformer Stand Foundations	18	EA	\$ 4,482	\$ 80,676	\$ 4,800	\$ 86,400	\$ 9,282	\$ 167,076
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 425,790		\$ 456,000		\$ 881,790

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	2	EA	\$ 37,000	\$ 74,000	\$ 37,000	\$ 74,000	\$ 74,000	\$ 148,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	7	EA	\$ 14,800	\$ 103,600	\$ 14,800	\$ 103,600	\$ 29,600	\$ 207,200
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	17	EA	\$ 3,700	\$ 62,900	\$ 3,700	\$ 62,900	\$ 7,400	\$ 125,800
3.1g	Instrument Transformer Stand	18	EA	\$ 1,850	\$ 33,300	\$ 1,850	\$ 33,300	\$ 3,700	\$ 66,600
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 299,700		\$ 299,700		\$ 599,400
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 600,000		\$ 240,000		\$ 840,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000
5.1b	Disconnect Switches - 3ph w/ manual operator	5	EA	\$ 35,000	\$ 175,000	\$ 17,500	\$ 87,500	\$ 52,500	\$ 262,500
5.1c	VT'S	6	EA	\$ 25,000	\$ 150,000	\$ 12,000	\$ 72,000	\$ 37,000	\$ 222,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 645,500		\$ 315,000		\$ 960,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	7	EA	\$ 35,000	\$ 245,000	\$ 10,000	\$ 70,000	\$ 45,000	\$ 315,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 68,850	\$ 68,850	\$ 68,850	\$ 68,850	\$ 137,700	\$ 137,700
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 313,850		\$ 138,850		\$ 452,700
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	L.S.	\$ 44,400.00	\$ 44,400	\$ 81,600.00	\$ 81,600	\$ 126,000	\$ 126,000
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ 75,042.00	\$ 75,042	\$ 142,260.00	\$ 142,260	\$ 217,302	\$ 217,302
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ 58,950.00	\$ 58,950	\$ 80,025.00	\$ 80,025	\$ 138,975	\$ 138,975
7.4	Grounding System	1	L.S.	\$ 31,185.00	\$ 31,185	\$ 219,915.00	\$ 219,915	\$ 251,100	\$ 251,100

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 292,289		\$ 689,000		\$ 981,289
<b>F. Edic Substation - Install</b>					\$ 2,676,429		\$ 2,534,800		\$ 5,211,229
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 52,112	\$ 52,112	\$ 52,112	\$ 52,112
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 198,066	\$ 198,066	\$ 198,066	\$ 198,066
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 52,112	\$ 52,112	\$ 52,112	\$ 52,112
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 52,112	\$ 52,112	\$ 52,112	\$ 52,112
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 416,898	\$ 416,898	\$ 416,898	\$ 416,898
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 36,479	\$ 36,479	\$ 36,479	\$ 36,479
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 130,281	\$ 130,281	\$ 130,281	\$ 130,281
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 15,634	\$ 15,634	\$ 15,634	\$ 15,634
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 214,114	\$ 214,114	\$ -	\$ -	\$ 214,114	\$ 214,114
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 5,211	\$ 5,211	\$ 5,211	\$ 5,211
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 214,114		\$ 992,905		\$ 1,207,020

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**G. Edic Substation - Removal**

Estimate Revision: **8**

Total: \$ **140,423**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>G. Edic Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 86,250	\$ 86,250
2. SUBSTATION FOUNDATIONS	\$ -	\$ 14,000	\$ 14,000
3. SUBSTATION STRUCTURES	\$ -	\$ 6,750	\$ 6,750
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ 10,500
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 18,423	\$ 18,423
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 129,923	\$ 140,423
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 129,923	\$ 140,423

0.0%

0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Edic Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.			\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	575	LF	\$ -	\$ -	\$ 150	\$ 86,250	\$ 150	\$ 86,250
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>						\$ -	\$ 86,250		\$ 86,250
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 14,000	\$ 14,000	\$ 14,000	\$ 14,000
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 14,000		\$ 14,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	3	EA	\$ -	\$ -	\$ 2,250	\$ 6,750	\$ 2,250	\$ 6,750
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 6,750		\$ 6,750
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 10,500.00	\$ 10,500	\$ 10,500	\$ 10,500
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 10,500		\$ 10,500
<b>G. Edic Substation - Removal</b>					\$ -		\$ 122,000		\$ 122,000
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,220	\$ 1,220	\$ 1,220	\$ 1,220
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS		\$ -	\$ 4,637	\$ 4,637	\$ 4,637	\$ 4,637
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,220	\$ 1,220	\$ 1,220	\$ 1,220
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,220	\$ 1,220	\$ 1,220	\$ 1,220
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 9,760	\$ 9,760	\$ 9,760	\$ 9,760
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 854	\$ -	\$ 854	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 3,050	\$ -	\$ 3,050	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 366	\$ 366	\$ 366	\$ 366
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 122	\$ -	\$ 122	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 18,423		\$ 18,423

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**H. New Scotland Substation - Install**

Estimate Revision: **8**

Total: \$ **9,382,733**

<i>NAT &amp; NYPA - T027 - (Segment A, Double Circuit)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>H. New Scotland Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 32,400	\$ 90,000	\$ 122,400
2. SUBSTATION FOUNDATIONS	\$ 615,528	\$ 659,200	\$ 1,274,728
3. SUBSTATION STRUCTURES	\$ 296,000	\$ 296,000	\$ 592,000
4. MAJOR EQUIPMENT	\$ 800,000	\$ 320,000	\$ 1,120,000
5. SMALL EQUIPMENT / MATERIALS	\$ 590,500	\$ 329,500	\$ 920,000
6. CONTROL HOUSE / PANELS	\$ 937,050	\$ 660,000	\$ 1,597,050
7. MISC ITEMS	\$ 826,181	\$ 1,183,505	\$ 2,009,686
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 327,813	\$ 1,419,056	\$ 1,746,869
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 4,425,472	\$ 4,957,261	\$ 9,382,733
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 4,425,472	\$ 4,957,261	\$ 9,382,733

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. New Scotland Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	1,200	CY	\$ 27	\$ 32,400	\$ 75	\$ 90,000	\$ 102	\$ 122,400
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 32,400		\$ 90,000		\$ 122,400
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	4	EA	\$ 14,940	\$ 59,760	\$ 16,000	\$ 64,000	\$ 30,940	\$ 123,760
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 26,145	\$ 209,160	\$ 28,000	\$ 224,000	\$ 54,145	\$ 433,160
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	24	EA	\$ 4,482	\$ 107,568	\$ 4,800	\$ 115,200	\$ 9,282	\$ 222,768
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	21	EA	\$ 4,482	\$ 94,122	\$ 4,800	\$ 100,800	\$ 9,282	\$ 194,922
2.1j	Instrument Transformer Stand Foundations	21	EA	\$ 4,482	\$ 94,122	\$ 4,800	\$ 100,800	\$ 9,282	\$ 194,922
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 615,528		\$ 659,200		\$ 1,274,728
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	2	EA	\$ 37,000	\$ 74,000	\$ 37,000	\$ 74,000	\$ 74,000	\$ 148,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	4	EA	\$ 14,800	\$ 59,200	\$ 14,800	\$ 59,200	\$ 29,600	\$ 118,400
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	21	EA	\$ 3,700	\$ 77,700	\$ 3,700	\$ 77,700	\$ 7,400	\$ 155,400
3.1g	Instrument Transformer Stand	21	EA	\$ 1,850	\$ 38,850	\$ 1,850	\$ 38,850	\$ 3,700	\$ 77,700
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	3	EA	\$ 7,400	\$ 22,200	\$ 7,400	\$ 22,200	\$ 14,800	\$ 44,400
3.1k	Lightning Masts - 70'	2	EA	\$ 6,475	\$ 12,950	\$ 6,475	\$ 12,950	\$ 12,950	\$ 25,900
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>						\$ 296,000	\$ 296,000		\$ 592,000
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	4	EA	\$ 200,000	\$ 800,000	\$ 80,000	\$ 320,000	\$ 280,000	\$ 1,120,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>						\$ 800,000	\$ 320,000		\$ 1,120,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000
5.1b	Disconnect Switches - 3ph w/ manual operator	4	EA	\$ 35,000	\$ 140,000	\$ 17,500	\$ 70,000	\$ 52,500	\$ 210,000
5.1c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 12,000	\$ 72,000	\$ 25,000	\$ 150,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 590,500		\$ 329,500		\$ 920,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 243,750	\$ 243,750	\$ 42,500	\$ 42,500	\$ 286,250	\$ 286,250
6.2	Protection and Telecom Equipment Panels	8	EA	\$ 35,000	\$ 280,000	\$ 15,000	\$ 120,000	\$ 50,000	\$ 400,000
6.3	125VDC Batteries	1	EA	\$ 75,000	\$ 75,000	\$ 25,000	\$ 25,000	\$ 100,000	\$ 100,000
6.4	Control Cables	1	LS	\$ 338,300	\$ 338,300	\$ 472,500	\$ 472,500	\$ 810,800	\$ 810,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 937,050		\$ 660,000		\$ 1,597,050
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,500	LF	\$ 185.00	\$ 277,500	\$ 170.00	\$ 255,000	\$ 355	\$ 532,500
7.2	Rigid Bus, Fittings & Insulators	800	LF	\$ 125.07	\$ 100,056	\$ 237.10	\$ 189,680	\$ 362	\$ 289,736
7.3	Strain Bus, Connectors & Insulators	500	LF	\$ 39.30	\$ 19,650	\$ 53.35	\$ 26,675	\$ 93	\$ 46,325
7.4	Grounding System	7,500	LF	\$ 6.93	\$ 51,975	\$ 32.58	\$ 244,350	\$ 40	\$ 296,325
7.5	Strain Bus Insulators - 345kV	36	EA	\$ 2,000	\$ 72,000	\$ 1,050	\$ 37,800	\$ 3,050	\$ 109,800
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12	Install new communication tower foundation.	1	LS			\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000
7.13	Relocate existing communication tower.	1	LS			\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 826,181		\$ 1,183,505		\$ 2,009,686
<b>H. New Scotland Substation - Install</b>					\$ 4,097,659		\$ 3,538,205		\$ 7,635,864
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 76,359	\$ 76,359	\$ 76,359	\$ 76,359
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 290,220	\$ 290,220	\$ 290,220	\$ 290,220
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 76,359	\$ 76,359	\$ 76,359	\$ 76,359
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 76,359	\$ 76,359	\$ 76,359	\$ 76,359
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 610,869	\$ 610,869	\$ 610,869	\$ 610,869
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 53,451	\$ 53,451	\$ 53,451	\$ 53,451
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 190,897	\$ 190,897	\$ 190,897	\$ 190,897
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 22,908	\$ 22,908	\$ 22,908	\$ 22,908
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 327,813	\$ 327,813	\$ -	\$ -	\$ 327,813	\$ 327,813
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 7,636	\$ 7,636	\$ 7,636	\$ 7,636
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 327,813		\$ 1,419,056		\$ 1,746,869

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**I. New Scotland Substation - Removal**

Estimate Revision: **8**

Total: \$ **93,577**

<i>NAT &amp; NYPA - T027 - (Segment A, Double Circuit)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>I. New Scotland Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 28,800	\$ 28,800
3. SUBSTATION STRUCTURES	\$ -	\$ 27,000	\$ 27,000
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 21,000	\$ 21,000
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 12,277	\$ 12,277
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 93,577	\$ 93,577
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 93,577	\$ 93,577

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. New Scotland Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	12	EA	\$ -	\$ -	\$ 2,400	\$ 28,800	\$ 2,400	\$ 28,800
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL	
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -	
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -	
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -	
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -	
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -	
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -	
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>2.3</b>	<b>115kV</b>									
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -	
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>2.4</b>	<b>Transformer Foundations</b>									
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -	
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>2.5</b>	<b>Control House Foundations / Pad</b>									
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>2.6</b>	<b>Lightning Mast Foundations</b>									
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 28,800		\$ 28,800	
<b>3. SUBSTATION STRUCTURES</b>										
<b>3.1</b>	<b>345kV</b>									
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1f	Bus Support 1 Ph	12	EA	\$ -	\$ -	\$ 2,250	\$ 27,000	\$ 2,250	\$ 27,000	
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1k	Lightning Masts - 70'	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>3.2</b>	<b>230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -	
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -	
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -	
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -	
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -	

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 27,000		\$ 27,000
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	PANELS	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Protection and Telecom Equipment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 21,000.00	\$ 21,000	\$ 21,000	\$ 21,000
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 21,000		\$ 21,000
<b>I. New Scotland Substation - Removal</b>					\$ -		\$ 81,300		\$ 81,300
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 813	\$ 813	\$ 813	\$ 813
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,090	\$ 3,090	\$ 3,090	\$ 3,090
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 813	\$ 813	\$ 813	\$ 813
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 813	\$ 813	\$ 813	\$ 813
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 6,504	\$ 6,504	\$ 6,504	\$ 6,504
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 569	\$ -	\$ 569	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 2,033	\$ -	\$ 2,033	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 244	\$ 244	\$ 244	\$ 244
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 81	\$ -	\$ 81	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 12,277		\$ 12,277

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**J. Porter Substation - Install**

Estimate Revision: **8**

Total: \$ **86,130**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ 15,008	\$ 56,904	\$ 71,912
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,201	\$ 13,017	\$ 14,217
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 16,209	\$ 69,921	\$ 86,130
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 16,209	\$ 69,921	\$ 86,130

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Porter Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>						\$ -	\$ -	\$ -	\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200,000	\$ -	\$ 80,000	\$ -	\$ 280,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j		0	EA	\$ 15,000	\$ -	\$ 7,500	\$ -	\$ 22,500	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ 35,000	\$ -	\$ 10,000	\$ -	\$ 45,000	\$ -
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cable	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ 15,008.40	\$ 15,008	\$ 56,904.00	\$ 56,904	\$ 71,912	\$ 71,912
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Cables	0	LS	\$ 472,500	\$ -	\$ 472,500	\$ -	\$ 945,000	\$ -
7.11	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.12	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>J. Porter Substation - Install</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS	\$ -	\$ -	\$ 2,733	\$ 2,733	\$ 2,733	\$ 2,733
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,753	\$ 5,753	\$ 5,753	\$ 5,753
8.6	LiDAR	-	LS	\$ -	\$ -	\$ 216	\$ -	\$ 216	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 503	\$ 503	\$ 503	\$ 503
<b>Testing &amp; Commissioning</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,798	\$ 1,798	\$ 1,798	\$ 1,798
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,201	\$ 1,201	\$ -	\$ -	\$ 1,201	\$ 1,201
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 72	\$ 72	\$ 72	\$ 72
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,201		\$ 13,017		\$ 14,217

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**K. Porter Substation - Removal**

Estimate Revision: **8** Total: \$ **545,937**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>K. Porter Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 126,600	\$ 126,600
3. SUBSTATION STRUCTURES	\$ -	\$ 206,100	\$ 206,100
4. MAJOR EQUIPMENT	\$ -	\$ 43,500	\$ 43,500
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 59,500	\$ 59,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 38,613	\$ 38,613
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 71,625	\$ 71,625
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 545,937	\$ 545,937
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 545,937	\$ 545,937

0.0%

0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Porter Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	3	EA	\$ -	\$ -	\$ 7,200	\$ 21,600	\$ 7,200	\$ 21,600
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2e	Switch Stand Foundations	5	EA	\$ -	\$ -	\$ 5,200	\$ 26,000	\$ 5,200	\$ 26,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	4	EA	\$ -	\$ -	\$ 2,400	\$ 9,600	\$ 2,400	\$ 9,600
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad (40'x125')	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 126,600		\$ 126,600
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	6	EA	\$ -	\$ -	\$ 9,750	\$ 58,500	\$ 9,750	\$ 58,500
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 206,100		\$ 206,100
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	3	EA	\$ -	\$ -	\$ 14,500	\$ 43,500	\$ 14,500	\$ 43,500
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 43,500		\$ 43,500
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	2	EA	\$ -	\$ -	\$ 5,500	\$ 11,000	\$ 5,500	\$ 11,000
5.2b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2c	VT'S	2	EA	\$ -	\$ -	\$ 1,500	\$ 3,000	\$ 1,500	\$ 3,000
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	6	EA	\$ -	\$ -	\$ 1,500	\$ 9,000	\$ 1,500	\$ 9,000
5.2f	Arresters	6	EA	\$ -	\$ -	\$ 2,500	\$ 15,000	\$ 2,500	\$ 15,000
5.2g	Wave Traps	2	EA	\$ -	\$ -	\$ 2,500	\$ 5,000	\$ 2,500	\$ 5,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 59,500		\$ 59,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	PANELS	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Protection and Telecom Equipment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ -	\$ -	\$ 18,937.50	\$ 18,938	\$ 18,938	\$ 18,938
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ -	\$ -	\$ 19,675.00	\$ 19,675	\$ 19,675	\$ 19,675
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 38,613		\$ 38,613
<b>K. Porter Substation - Removal</b>					\$ -		\$ 474,313		\$ 474,313
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS		\$ -	\$ 18,027	\$ 18,027	\$ 18,027	\$ 18,027
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
8.4	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Engineering</b>									
8.5	Design Engineering	1.0	LS	\$ -	\$ -	\$ 37,945	\$ 37,945	\$ 37,945	\$ 37,945
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 3,320	\$ -	\$ 3,320	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 11,858	\$ -	\$ 11,858	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,423	\$ 1,423	\$ 1,423	\$ 1,423
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1.0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ 474	\$ -	\$ 474	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 71,625		\$ 71,625

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**L. Interconnection Edic Station**

Estimate Revision: **8** Total: \$ **2,104,121**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>L. Interconnection Edic Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 168,366	\$ 170,169	\$ 338,536
3. STRUCTURES	\$ 501,469	\$ 321,821	\$ 823,289
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 160,000	\$ 94,400	\$ 254,400
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 66,387	\$ 253,659	\$ 320,046
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 896,222	\$ 1,207,899	\$ 2,104,121
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 896,222	\$ 1,207,899	\$ 2,104,121

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Edic Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 27’	3	EA	\$ 41,332	\$ 123,995	\$ 41,774	\$ 125,322	\$ 83,106	\$ 249,317
2.2	Foundation – Drilled Pier – 8’X 29’	1	EA	\$ 44,372	\$ 44,372	\$ 44,847	\$ 44,847	\$ 89,219	\$ 89,219
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 168,366		\$ 170,169		\$ 338,536
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) – 105'	3	Structure	\$ 98,883	\$ 296,648	\$ 59,330	\$ 177,989	\$ 158,212	\$ 474,636
3.2	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.3	Install Grounding and Grounding Accessories	4	Pole	\$ 506	\$ 2,024	\$ 5,539	\$ 22,154	\$ 6,045	\$ 24,178
3.4				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.5									
3.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.11				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.12				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.13				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.14				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.15				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - STRUCTURES</b>					\$ 501,469		\$ 321,821		\$ 823,289
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)								
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)								
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)								
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.11	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15									
5.16									
5.17									
5.18									
5.19	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 160,000		\$ 94,400		\$ 254,400
<b>L. Interconnection Edic Station</b>					\$ 829,835		\$ 954,240		\$ 1,784,075
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 67,808	\$ 67,808	\$ 67,808	\$ 67,808
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 89,204	\$ 89,204	\$ 89,204	\$ 89,204
6.6	LiDAR	-	LS	\$ -	\$ -	\$ 5,352	\$ -	\$ 5,352	\$ -
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,489	\$ 12,489	\$ 12,489	\$ 12,489
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,352	\$ 5,352	\$ 5,352	\$ 5,352
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 66,387	\$ 66,387	\$ -	\$ -	\$ 66,387	\$ 66,387
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 1,784	\$ 1,784	\$ 1,784	\$ 1,784
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 66,387		\$ 253,659		\$ 320,046

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**M. Interconnection New Scotland Station**

Estimate  
Revision: **8**

Total: \$ **3,075,099**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>M. Interconnection New Scotland Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 365,657	\$ 473,093	\$ 838,749
3. STRUCTURES	\$ 655,465	\$ 445,628	\$ 1,101,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,555	\$ 26,100	\$ 29,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 161,130	\$ 95,795	\$ 256,925
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 94,864	\$ 385,963	\$ 480,828
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,794,428</b>	<b>\$ 3,075,099</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,794,428</b>	<b>\$ 3,075,099</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection New Scotland Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 50’	3	EA	\$ 76,500	\$ 229,501	\$ 77,320	\$ 231,959	\$ 153,820	\$ 461,459
2.2	Foundation – Drilled Pier – 8’X 89’	1	EA	\$ 136,156	\$ 136,156	\$ 137,614	\$ 137,614	\$ 273,770	\$ 273,770
2.3	Rock Excavation Adder	51.8	CY	\$ -	\$ -	\$ 2,000	\$ 103,520	\$ 2,000	\$ 103,520
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 365,657		\$ 473,093		\$ 838,749
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	3	Structure	\$ 178,026	\$ 534,077	\$ 106,815	\$ 320,446	\$ 284,841	\$ 854,522
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	Install Grounding and Grounding Accessories	10	Pole	\$ 506	\$ 5,060	\$ 5,539	\$ 55,385	\$ 6,045	\$ 60,445
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES</b>					\$ 655,465		\$ 445,628		\$ 1,101,092
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	1,500	LF	\$ 1.90	\$ 2,850	\$ 5.00	\$ 7,500	\$ 6.90	\$ 10,350
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	-	\$ 5.00	-	\$ 6.35	-
4.3	(1) 3/8" EHS7 Steel	1,500	LF	\$ 0.47	\$ 705	\$ 5.00	\$ 7,500	\$ 5.47	\$ 8,205
4.5	Remove Existing 345KV Cable From Existing Structures	0.3	Mile	\$ -	\$ -	\$ 30,000	\$ 7,500	\$ 30,000.00	\$ 7,500
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	-	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	0.3	Mile	\$ -	\$ -	\$ 12,000	\$ 3,600	\$ 12,000.00	\$ 3,600
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	-	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	-	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,555		\$ 26,100		\$ 29,655
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 725	\$ -	\$ 1,625	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.10	Spacer - Conductor	9	EA	\$ 50	\$ 450	\$ 35	\$ 315	\$ 85	\$ 765
5.11	Vibration Dampers - Conductor	48	EA	\$ 35	\$ 1,680	\$ 35	\$ 1,680	\$ 70	\$ 3,360
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15									
5.16	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 161,130		\$ 95,795		\$ 256,925
<b>M. Interconnection New Scotland Station</b>					\$ 1,185,806		\$ 1,408,465		\$ 2,594,271
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 98,602	\$ 98,602	\$ 98,602	\$ 98,602
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 129,714	\$ 129,714	\$ 129,714	\$ 129,714
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 18,160	\$ 18,160	\$ 18,160	\$ 18,160
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 94,864	\$ 94,864	\$ -	\$ -	\$ 94,864	\$ 94,864
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,594	\$ 2,594	\$ 2,594	\$ 2,594
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 94,864		\$ 385,963		\$ 480,828

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**N. Interconnection Rotterdam Station**

Estimate Revision: **8** Total: \$ **4,561,342**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>N. Interconnection Rotterdam Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,233,050	\$ 1,233,050
2. FOUNDATIONS	\$ 192,145	\$ 325,963	\$ 518,108
3. STRUCTURES	\$ 546,722	\$ 837,150	\$ 1,383,872
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 65,923	\$ 437,250	\$ 503,173
5. INSULATORS, FITTINGS, HARDWARE	\$ 165,730	\$ 118,480	\$ 284,210
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 77,642	\$ 561,288	\$ 638,929
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,513,181</b>	<b>\$ 4,561,342</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,513,181</b>	<b>\$ 4,561,342</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Rotterdam Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	7.0	Acre	\$ -	\$ -	\$ 15,000	\$ 105,000	\$ 15,000	\$ 105,000
1.2	Clearing the ROW - Light (mowing)	5.0	Acre	\$ -	\$ -	\$ 5,000	\$ 25,000	\$ 5,000	\$ 25,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	4,800.0	LF	\$ -	\$ -	\$ 4	\$ 19,200	\$ 4	\$ 19,200
1.5	Matting - Access and ROW	4,800.0	LF	\$ -	\$ -	\$ 70	\$ 336,000	\$ 70	\$ 336,000
1.6	Matting - To Work Area	2,400.0	LF	\$ -	\$ -	\$ 70	\$ 168,000	\$ 70	\$ 168,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	1.0	Mile	\$ -	\$ -	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
1.9	Work Pads	160,000.0	SF	\$ -	\$ -	\$ 4	\$ 563,200	\$ 4	\$ 563,200
1.10	Restoration for Work Pad areas	32,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 4,800	\$ 0	\$ 4,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>				\$ -	\$ -	\$ -	\$ 1,233,050	\$ -	\$ 1,233,050
<b>2. FOUNDATIONS</b>									
2.1	10' ED Rock BF	6	EA	\$ 358	\$ 2,145	\$ 3,575	\$ 21,450	\$ 3,933	\$ 23,595
2.2	15' ED Rock BF	18	EA	\$ 536	\$ 9,653	\$ 5,363	\$ 96,525	\$ 5,899	\$ 106,178
2.3	20' ED Rock BF	4	EA	\$ 715	\$ 2,860	\$ 7,150	\$ 28,600	\$ 7,865	\$ 31,460
2.4	Foundation - Drilled Pier - 8'X 29'	4	EA	\$ 44,372	\$ 177,487	\$ 44,847	\$ 179,388	\$ 89,219	\$ 356,875
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.11				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.12				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 192,145		\$ 325,963		\$ 518,108
<b>3. STRUCTURES</b>									
3.1	15kv 3-CKT TANGENT DIST. - WOOD POLE	3	Pole	\$ 3,500	\$ 10,500	\$ 3,600	\$ 10,800	\$ 7,100	\$ 21,300
3.2	15kv 3-CKT MA DIST. - WOOD POLE	1	Pole	\$ 3,500	\$ 3,500	\$ 3,600	\$ 3,600	\$ 7,100	\$ 7,100
3.3	15kv 3-CKT DE - WOOD POLE	2	Pole	\$ 3,500	\$ 7,000	\$ 3,600	\$ 7,200	\$ 7,100	\$ 14,200
3.4	115kv 1-CKT TANGENT - WOOD POLE	5	Pole	\$ 4,500	\$ 22,500	\$ 4,400	\$ 22,000	\$ 8,900	\$ 44,500
3.5	115kv 1-CKT MA - WOOD POLE	2	Pole	\$ 4,500	\$ 9,000	\$ 4,400	\$ 8,800	\$ 8,900	\$ 17,800
3.6	115kv 1-CKT DE - WOOD POLE	11	Pole	\$ 5,500	\$ 60,500	\$ 5,000	\$ 55,000	\$ 10,500	\$ 115,500
3.7	115kv 2-CKT TANGENT - WOOD POLE	4	Pole	\$ 5,500	\$ 22,000	\$ 5,000	\$ 20,000	\$ 10,500	\$ 42,000
3.8	115kv 2-CKT DE - STEEL POLE	4	Pole	\$ 98,883	\$ 395,530	\$ 59,330	\$ 237,318	\$ 158,212	\$ 632,848
3.9	Remove Existing Structure and Accessories	24	EA		\$ -	\$ 12,300	\$ 295,200	\$ 12,300	\$ 295,200
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12	Install Grounding and Grounding Accessories	32	Pole	\$ 506	\$ 16,192	\$ 5,539	\$ 177,232	\$ 6,045	\$ 193,424
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 546,722		\$ 837,150		\$ 1,383,872
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	23,400	LF	\$ 1.90	\$ 44,460	\$ 5.00	\$ 117,000	\$ 6.90	\$ 161,460
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	7,800	LF	\$ 0.47	\$ 3,666	\$ 5.00	\$ 39,000	\$ 5.47	\$ 42,666
4.5	Remove Existing Cable	6.6	Mile	\$ -	\$ -	\$ 30,000	\$ 197,700	\$ 30,000.00	\$ 197,700
4.6	Remove Existing EHT	2.2	Mile	\$ -	\$ -	\$ 12,000	\$ 26,400	\$ 12,000.00	\$ 26,400
4.7	15kv - (1) 477kcmil 26/7 ACSR "Hawk"	9,630	LF	\$ 1.62	\$ 15,601	\$ 5.00	\$ 48,150	\$ 6.62	\$ 63,751
4.8	15kv - (1) 336kcmil 26/7 ACSR "Linnet"	1,800	LF	\$ 1.22	\$ 2,196	\$ 5.00	\$ 9,000	\$ 6.22	\$ 11,196
4.9		-							
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 65,923		\$ 437,250		\$ 503,173
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	115kv Tangent (1-Group of 9-Bells Each Assembly)	33	Assembly	\$ 1,000	\$ 33,000	\$ 560	\$ 18,480	\$ 1,560	\$ 51,480
5.2	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	66	Assembly	\$ 1,000	\$ 66,000	\$ 560	\$ 36,960	\$ 1,560	\$ 102,960
5.3	15kv Tangent	12	Assembly	\$ 100	\$ 1,200	\$ 75	\$ 900	\$ 175	\$ 2,100
5.4	15kv Dead-end & Angle Insulators	18	Assembly	\$ 100	\$ 1,800	\$ 75	\$ 1,350	\$ 175	\$ 3,150
5.5	Neutral, Distribution, Tangent	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.6	Neutral, Distribution, DE/Side	2	Assembly	\$ 100	\$ 200	\$ 75	\$ 150	\$ 175	\$ 350
5.7	Jumper, DE/Angle, 3PH	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.8	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OSHW Assembly - Tangent	11	Assembly	\$ 250	\$ 2,750	\$ 150	\$ 1,650	\$ 400	\$ 4,400
5.10	OHSW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.11	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.12	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.13	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.14	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.16	Guys, Anchors, and Accessories	14.0	EA	\$ 720	\$ 10,080	\$ 885	\$ 12,390	\$ 1,605	\$ 22,470
5.17	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	8	EA	\$ 5,000	\$ 40,000	\$ 5,000	\$ 40,000	\$ 10,000	\$ 80,000
5.20					\$ -		\$ -		\$ -
5.21					\$ -		\$ -		\$ -
5.22					\$ -		\$ -		\$ -
5.23					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 165,730		\$ 118,480		\$ 284,210
<b>N. Interconnection Rotterdam Station</b>					\$ 970,519		\$ 2,951,893		\$ 3,922,412
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
	Contractor Mobilization / Demobilization								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 149,081	\$ 149,081	\$ 149,081	\$ 149,081
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 196,121	\$ 196,121	\$ 196,121	\$ 196,121
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 27,457	\$ 27,457	\$ 27,457	\$ 27,457
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 77,642	\$ 77,642	\$ -	\$ -	\$ 77,642	\$ 77,642
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 3,922	\$ 3,922	\$ 3,922	\$ 3,922
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 77,642		\$ 561,288		\$ 638,929

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**System Upgrade Facilities (Everett - Wolf Road 115kV - 1.3 mile Line Upgrade)**

Estimate  
Revision: **8**

**Total: \$ 4,464,375**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Su	Labor & Equipment Su	Total Unit Rate	TOTAL
SUF 1	Everett - Wolf Road 115kV 1.3 mile line upgrade	1.00	LS	\$ -	\$ -	\$ -	\$ -	\$ 35,714,286	\$ 3,571,500
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 892,875
SUF 1	<b>SUF 1 - TOTAL:</b>				\$ -		\$ -		\$ <b>4,464,375</b>

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**System Upgrade Facilities (Various Stations for Edic/Marcy to New Scotland)**

Estimate Revision: **8**

**Total: \$ 6,899,000**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
SUF SS1	Marcy 345kV Bay 3300 - Reconductor Strain Bus UNS-18 Marcy-New Scotland Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 664,560	\$ 665,000
SUF SS1	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 30,000
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 174,000
<b>SUF SS1</b>	<b>SUF SS1 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 869,000</b>
SUF SS2	Marcy 345kV Bay 3100 - Reconductor Strain Bus, Replace (3) breakers and wave trap UE1-7- Marcy-Edic Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 2,946,086	\$ 2,947,000
SUF SS2	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 120,720	\$ 121,000
SUF SS2	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 767,000
<b>SUF SS2</b>	<b>SUFSS 2 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 3,835,000</b>
SUF SS3	Edic 345kV Bay - UE1-7- Marcy-Edic Line Replace (2) breakers and wave trap	1	LS					\$ 1,661,294	\$ 1,662,000
SUF SS3	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 93,120	\$ 94,000
SUF SS3	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 439,000
<b>SUF SS3</b>	<b>SUF SS3 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 2,195,000</b>
SUF SS4	Removals	-	LS	\$ -	\$ -	\$ -	\$ -		\$ -
SUF SS4	Removals		LS %					\$ -	\$ -
SUF SS4	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS4</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
SUF SS5	Removals	-	LS	\$ -	\$ -	\$ -	\$ -		\$ -
SUF SS5	Removals		LS %					\$ -	\$ -
SUF SS5	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS5</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>STATIONS SUF DIRECT TOTAL:</b>									<b>\$ 5,519,000</b>
<b>STATIONS SUF INDIRECT TOTAL:</b>									<b>\$ 1,380,000</b>
<b>STATIONS SUF TOTAL</b>									<b>\$ 6,899,000</b>

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**Q. Princetown Substation GIS - Install**

Estimate Revision: **8**

Total: \$ **37,290,171**

NAT & NYPA - T027 - (Segment A, Double Circuit)			
	Supply	Installation	Total
<b>Q. Princetown Substation GIS - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 176,795	\$ 963,025	\$ 1,139,820
2. SUBSTATION FOUNDATIONS	\$ 1,377,110	\$ 1,474,680	\$ 2,851,790
3. SUBSTATION STRUCTURES	\$ 381,100	\$ 381,100	\$ 762,200
4. MAJOR EQUIPMENT	\$ 12,700,000	\$ 4,266,670	\$ 16,966,670
5. SMALL EQUIPMENT / MATERIALS	\$ 1,319,000	\$ 590,000	\$ 1,909,000
6. CONTROL HOUSE / PANELS	\$ 3,727,920	\$ 1,422,920	\$ 5,150,840
7. MISC ITEMS	\$ 358,177	\$ 733,260	\$ 1,091,437
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,603,208	\$ 5,815,206	\$ 7,418,414
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 21,643,310	\$ 15,646,861	\$ 37,290,171
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 21,643,310	\$ 15,646,861	\$ 37,290,171

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Q. Princetown Substation GIS - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.3	ACRES	\$ -	\$ -	\$ 203,000	\$ 659,750	\$ 203,000	\$ 659,750
1.2	Station stone within substation fence.	1,385	CY	\$ 27	\$ 37,395	\$ 75	\$ 103,875	\$ 102	\$ 141,270
1.3	Substation Fence	1,310	LF	\$ 100	\$ 131,000	\$ 100	\$ 131,000	\$ 200	\$ 262,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide (From Gordon RD)	240	LF	\$ 35	\$ 8,400	\$ 285	\$ 68,400	\$ 320	\$ 76,800
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 176,795		\$ 963,025		\$ 1,139,820
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	16	EA	\$ 26,145	\$ 418,320	\$ 28,000	\$ 448,000	\$ 54,145	\$ 866,320
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	1	EA	\$ 2,988	\$ 2,988	\$ 3,200	\$ 3,200	\$ 6,188	\$ 6,188
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 912,910	\$ 912,910	\$ 977,680	\$ 977,680	\$ 1,890,590	\$ 1,890,590
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,377,110	\$ 1,474,680	\$ 2,851,790		
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	6	EA	\$ 37,000	\$ 222,000	\$ 37,000	\$ 222,000	\$ 74,000	\$ 444,000
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	36	EA	\$ 1,850	\$ 66,600	\$ 1,850	\$ 66,600	\$ 3,700	\$ 133,200
3.1h	Arrester Stand	18	EA	\$ 1,850	\$ 33,300	\$ 1,850	\$ 33,300	\$ 3,700	\$ 66,600
3.1j	Wave Trap Stand	6	EA	\$ 7,400	\$ 44,400	\$ 7,400	\$ 44,400	\$ 14,800	\$ 88,800
3.1k	Lightning Masts	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL	
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -	
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -	
<b>3.3</b>	<b>115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -	
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -	
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -	
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -	
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -	
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -	
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -	
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -	
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -	
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -	
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 381,100		\$ 381,100		\$ 762,200	
<b>4. MAJOR EQUIPMENT</b>										
<b>4.1</b>	<b>345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ 220,000	\$ -	\$ 80,000	\$ -	\$ 300,000	\$ -	
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -	
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ 3,300,000	\$ -	\$ 750,000	\$ -	\$ 4,050,000	\$ -	
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ 3,300,000	\$ -	\$ 750,000	\$ -	\$ 4,050,000	\$ -	
4.1e	345 kV (3) Bay Breaker-and-a-half GIS system	1	EA	\$ 12,700,000	\$ 12,700,000	\$ 4,266,670	\$ 4,266,670	\$ 16,966,670	\$ 16,966,670	
<b>4.2</b>	<b>230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -	
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -	
<b>4.3</b>	<b>115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -	
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -	
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 12,700,000		\$ 4,266,670		\$ 16,966,670	
<b>5. SMALL EQUIPMENT / MATERIALS</b>										
<b>5.1</b>	<b>345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	6	EA	\$ 40,000	\$ 240,000	\$ 17,500	\$ 105,000	\$ 57,500	\$ 345,000	
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -	
5.1c	VT'S	18	EA	\$ 25,000	\$ 450,000	\$ 12,000	\$ 216,000	\$ 37,000	\$ 666,000	
5.1d	CT'S	18	EA	\$ 13,000	\$ 234,000	\$ 8,000	\$ 144,000	\$ 21,000	\$ 378,000	
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -	
5.1f	Arresters	18	EA	\$ 6,500	\$ 117,000	\$ 1,500	\$ 27,000	\$ 8,000	\$ 144,000	
5.1g	Wave Traps	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000	
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000	
<b>5.2</b>	<b>230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -	
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -	
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -	
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -	
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -	
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -	
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -	
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
5.2j										
<b>5.3</b>	<b>115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -	
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -	
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -	
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -	
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -	
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -	
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,319,000		\$ 590,000		\$ 1,909,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 1,950,000	\$ 1,950,000	\$ 340,000	\$ 340,000	\$ 2,290,000	\$ 2,290,000
6.2	Protection and Telecom Equipment Panels	31	EA	\$ 35,000	\$ 1,085,000	\$ 10,000	\$ 310,000	\$ 45,000	\$ 1,395,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 227,920	\$ 227,920	\$ 227,920	\$ 227,920	\$ 455,840	\$ 455,840
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 3,727,920		\$ 1,422,920		\$ 5,150,840
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	200	LF	\$ 185.00	\$ 37,000	\$ 170.00	\$ 34,000	\$ 355	\$ 71,000
7.2	Rigid Bus	100	LF	\$ 125.07	\$ 12,507	\$ 237.10	\$ 23,710	\$ 362	\$ 36,217
7.3	Strain Bus	600	LF	\$ 39.30	\$ 23,580	\$ 53.35	\$ 32,010	\$ 93	\$ 55,590
7.4	Grounding System	13,000	LF	\$ 6.93	\$ 90,090	\$ 32.58	\$ 423,540	\$ 40	\$ 513,630
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
<b>TOTAL - MISC ITEMS</b>					\$ 358,177		\$ 733,260		\$ 1,091,437
<b>Q. Princetown Substation GIS - Install</b>					\$ 20,040,102		\$ 9,831,655		\$ 29,871,757
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 298,718	\$ 298,718	\$ 298,718	\$ 298,718
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS		\$ -	\$ 1,135,351	\$ 1,135,351	\$ 1,135,351	\$ 1,135,351
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 298,718	\$ 298,718	\$ 298,718	\$ 298,718
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 298,718	\$ 298,718	\$ 298,718	\$ 298,718
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,389,741	\$ 2,389,741	\$ 2,389,741	\$ 2,389,741
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 209,102	\$ 209,102	\$ 209,102	\$ 209,102
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 896,153	\$ 896,153	\$ 896,153	\$ 896,153
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 89,615	\$ 89,615	\$ 89,615	\$ 89,615

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 198,000	\$ 198,000	\$ 198,000	\$ 198,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,603,208	\$ 1,603,208	\$ -	\$ -	\$ 1,603,208	\$ 1,603,208
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 1,091	\$ 1,091	\$ 1,091	\$ 1,091
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,603,208		\$ 5,815,206		\$ 7,418,414

**NAT & NYPA - T027 - (Segment A, Double Circuit)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 3.289% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.
25	The SUF estimates for the Everett - Wolf Road 115kV 1.3 mile line segment upgrade was obtained from the SIS. SECo did not estimate.

<b>NY Power Authority and North American Transmission (T028)</b>			
<b>Description</b>		<b>Total Amount (In thousand \$)</b>	
<b>Direct Cost</b>	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$50,021
	1.2	Foundations	\$23,713
	1.3	Structures	\$60,645
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$35,494
	1.5	Insulators, Fitting and Hardwares	\$11,907
	Subtotal (1)		<b>\$181,780</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$48,340
	2.2	Edic Substation	\$2,153
	2.3	Princetown Substation	\$12,718
	2.4	New Scotland Substation	\$5,264
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,301	
Subtotal (2)		<b>\$77,322</b>	
Total (1+2)		\$259,101	
Contractors Mark-up (15% of Total 1+2)		\$38,865	
Total Direct Cost (A)		<b>\$297,967</b>	
<b>Indirect Cost</b>	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,591
	3.2	Project Management, Material Handling & Amenities	\$18,417
	3.3	Engineering	\$17,763
	3.4	Testing & Commissioning	\$1,840
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$20,533
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$8,096
Total Indirect Cost (3)		<b>\$78,159</b>	
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$376,125</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	Network upgrade facility proposed as element of the Project (Marcy and Edic Terminals)	\$7,727
	4.2	Network upgrade facility identified during Evaluation	\$0
<b>Subtotal NUF Cost (C)</b>		<b>\$7,727</b>	
<b>Total Project Cost (B+C) 2017 \$</b>		<b>\$383,852</b>	
<b>Total Project Cost 2018 \$</b>		<b>\$395,368</b>	

<b>NAT &amp; NYPA - T028 - (Segment A, Enhanced)</b>		
Estimate Revision: 7		
<b>NAT &amp; NYPA - T028 - (Segment A, Enhanced) - Direct Costs</b>		<b>Total Each Segment</b>
Direct Labor, Material & Equipment Costs	A. Transmission Line Edic to Princetown	\$ 122,948,939
Direct Labor, Material & Equipment Costs	B. Transmission Line Princetown to Rotterdam	\$ 20,488,282
Direct Labor, Material & Equipment Costs	C. Transmission Line Princetown to New Scotland	\$ 38,342,499
Direct Labor, Material & Equipment Costs	D. Rotterdam Substation - Install	\$ 44,728,474
Direct Labor, Material & Equipment Costs	E. Rotterdam Substation - Removal	\$ 3,611,030
Direct Labor, Material & Equipment Costs	F. Edic Substation - Install	\$ 2,117,185
Direct Labor, Material & Equipment Costs	G. Edic Substation - Removal	\$ 35,750
Direct Labor, Material & Equipment Costs	H. New Scotland Substation - Install	\$ 5,182,753
Direct Labor, Material & Equipment Costs	I. New Scotland Substation - Removal	\$ 81,300
Direct Labor, Material & Equipment Costs	J. Porter Substation - Install	\$ 71,912
Direct Labor, Material & Equipment Costs	K. Porter Substation - Removal	\$ 474,313
Direct Labor, Material & Equipment Costs	L. Interconnection Edic Station	\$ 1,784,075
Direct Labor, Material & Equipment Costs	M. Interconnection New Scotland Station	\$ 2,594,271
Direct Labor, Material & Equipment Costs	N. Interconnections (Various Lines for Edic to New Scotland)	\$ -
Direct Labor, Material & Equipment Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Direct Labor, Material & Equipment Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 5,519,000
Direct Labor, Material & Equipment Costs	Q. Interconnection Rotterdam Station	\$ 3,922,412
Direct Labor, Material & Equipment Costs	R. Princetown Switchyard - Install	\$ 12,718,239
<b>SUBTOTAL:</b>		<b>\$ 264,620,435</b>
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		<b>\$ 39,693,065</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>		<b>\$ -</b>
<b>TOTAL DIRECT:</b>		<b>\$ 304,313,500</b>
<b>NAT &amp; NYPA - T028 - (Segment A, Enhanced) - Indirect Costs</b>		<b>Total Each Segment</b>
Indirect Costs	A. Transmission Line Edic to Princetown	\$ 37,913,843
Indirect Costs	B. Transmission Line Princetown to Rotterdam	\$ 4,538,550
Indirect Costs	C. Transmission Line Princetown to New Scotland	\$ 9,279,647
Indirect Costs	D. Rotterdam Substation - Install	\$ 11,041,603
Indirect Costs	E. Rotterdam Substation - Removal	\$ 596,103
Indirect Costs	F. Edic Substation - Install	\$ 522,430
Indirect Costs	G. Edic Substation - Removal	\$ 5,866
Indirect Costs	H. New Scotland Substation - Install	\$ 1,260,653
Indirect Costs	I. New Scotland Substation - Removal	\$ 13,340
Indirect Costs	J. Porter Substation - Install	\$ 14,798
Indirect Costs	K. Porter Substation - Removal	\$ 77,824
Indirect Costs	L. Interconnection Edic Station	\$ 343,365
Indirect Costs	M. Interconnection New Scotland Station	\$ 514,737
Indirect Costs	N. Interconnections (Various Lines for Edic to New Scotland)	\$ -
Indirect Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Indirect Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ 1,380,000
Indirect Costs	Q. Interconnection Rotterdam Station	\$ 690,199
Indirect Costs	R. Princetown Switchyard - Install	\$ 3,249,664
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lisc. & Permit., and Envir. Mitagation)	\$ 8,095,924
<b>TOTAL INDIRECT:</b>		<b>\$ 79,538,546</b>
<b>TOTAL ESTIMATED COST:</b>		<b>\$ 383,852,046</b>

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**A. Transmission Line Edic to Princetown**

Estimate Revision: **7** **Total: \$ 160,862,783**

<b>NAT &amp; NYPA - T028 - (Segment A, Enhanced)</b>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>A. Transmission Line Edic to Princetown</b>			
1. CLEARING & ACCESS	\$ 41,500	\$ 35,680,876	\$ 35,722,376
2. FOUNDATIONS	\$ 3,098,282	\$ 10,723,946	\$ 13,822,229
3. STRUCTURES	\$ 14,839,646	\$ 25,190,231	\$ 40,029,876
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 4,932,573	\$ 20,897,590	\$ 25,830,163
5. INSULATORS, FITTINGS, HARDWARE	\$ 5,125,311	\$ 2,418,984	\$ 7,544,295
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,242,985	\$ 35,670,858	\$ 37,913,843
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 30,280,297	\$ 130,582,485	\$ 160,862,783
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 30,280,297	\$ 130,582,485	\$ 160,862,783

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Edic to Princetown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	8.0	Acre	\$ -	\$ -	\$ 15,000	\$ 120,000	\$ 15,000	\$ 120,000
1.2	Clearing the ROW - Light (mowing)	194.0	Acre	\$ -	\$ -	\$ 5,000	\$ 970,000	\$ 5,000	\$ 970,000
1.3	Permanent Access Road	70,540.8	LF	\$ -	\$ -	\$ 45	\$ 3,174,336	\$ 45	\$ 3,174,336
1.4	Silt Fence	352,704.0	LF	\$ -	\$ -	\$ 4	\$ 1,410,816	\$ 4	\$ 1,410,816
1.5	Matting - Access and ROW	282,163.2	LF	\$ -	\$ -	\$ 70	\$ 19,751,424	\$ 70	\$ 19,751,424
1.6	Matting - To Work Area	25,200.0	LF	\$ -	\$ -	\$ 70	\$ 1,764,000	\$ 70	\$ 1,764,000
1.7	Snow Removal	66.8	Mile	\$ -	\$ -	\$ 16,000	\$ 1,068,800	\$ 16,000	\$ 1,068,800
1.8	ROW Restoration	66.8	Mile	\$ -	\$ -	\$ 10,000	\$ 668,000	\$ 10,000	\$ 668,000
1.9	Work Pads	1,680,000.0	SF	\$ -	\$ -	\$ 4	\$ 5,913,600	\$ 4	\$ 5,913,600
1.10	Restoration for Work Pad areas	336,000.0	SF	\$ -	\$ -	\$ 0.15	\$ 50,400	\$ 0	\$ 50,400
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	50	EA	\$ -	\$ -	\$ 4,580	\$ 229,000	\$ 4,580	\$ 229,000
1.14	Maintenance and Protection of Traffic on Public Roads	100	LS	\$ -	\$ -	\$ 4,130	\$ 413,000	\$ 4,130	\$ 413,000
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	17	EA	\$ 2,000	\$ 34,000	\$ 2,500	\$ 42,500	\$ 4,500	\$ 76,500
1.17	Concrete Washout Station	50	EA	\$ -	\$ -	\$ 1,850	\$ 92,500	\$ 1,850	\$ 92,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 41,500		\$ 35,680,876		\$ 35,722,376
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 4' x 16'	416	EA	\$ 941	\$ 391,345	\$ 7,398	\$ 3,077,513	\$ 8,339	\$ 3,468,858
2.2	Direct Embed Foundations - 4' x 17'	2	EA	\$ 995	\$ 1,990	\$ 7,833	\$ 15,666	\$ 8,828	\$ 17,656
2.3	Direct Embed Foundations - 4' x 19'	52	EA	\$ 1,104	\$ 57,404	\$ 8,703	\$ 452,576	\$ 9,807	\$ 509,979
2.4	Direct Embed Foundations - 4' x 21'	4	EA	\$ 1,213	\$ 4,851	\$ 9,574	\$ 38,295	\$ 10,786	\$ 43,146
2.5	Direct Embed Foundations - 4' x 23'	16	EA	\$ 1,322	\$ 21,144	\$ 10,444	\$ 167,105	\$ 11,766	\$ 188,249
2.6	Direct Embed Foundations - 4' x 25'	4	EA	\$ 1,430	\$ 5,721	\$ 11,314	\$ 45,258	\$ 12,745	\$ 50,979
2.7	Direct Embed Foundations - 6' x 18'	6	EA	\$ 1,857	\$ 11,145	\$ 18,603	\$ 111,621	\$ 20,461	\$ 122,766
2.8	Direct Embed Foundations - 6' x 19'	6	EA	\$ 1,952	\$ 11,711	\$ 19,583	\$ 117,496	\$ 21,534	\$ 129,207
2.9	Direct Embed Foundations - 6' x 20'	14	EA	\$ 2,046	\$ 28,648	\$ 20,562	\$ 287,864	\$ 22,608	\$ 316,512
2.10	Direct Embed Foundations - 6' x 21'	15	EA	\$ 2,141	\$ 32,110	\$ 21,541	\$ 323,113	\$ 23,681	\$ 355,222
2.11	Direct Embed Foundations - 6' x 22'	7	EA	\$ 2,235	\$ 15,645	\$ 22,520	\$ 157,640	\$ 24,755	\$ 173,285
2.12	Direct Embed Foundations - 6' x 25'	6	EA	\$ 2,518	\$ 15,109	\$ 25,457	\$ 152,744	\$ 27,976	\$ 167,854
2.13	Direct Embed Foundations - 6' x 26'	1	EA	\$ 2,613	\$ 2,613	\$ 26,437	\$ 26,437	\$ 29,049	\$ 29,049
2.14	Direct Embed Foundations - 6' x 28'	3	EA	\$ 2,707	\$ 8,121	\$ 27,416	\$ 82,247	\$ 30,123	\$ 90,368
2.15	Direct Embed Foundations - 6' x 29'	3	EA	\$ 2,896	\$ 8,687	\$ 29,374	\$ 88,122	\$ 32,270	\$ 96,809
2.16	Direct Embed Foundations - 6' x 33'	3	EA	\$ 3,273	\$ 9,820	\$ 33,290	\$ 99,871	\$ 36,564	\$ 109,691
2.17	Direct Embed Foundations - 7' x 27'	2	EA	\$ 3,337	\$ 6,673	\$ 37,316	\$ 74,631	\$ 40,652	\$ 81,305
2.18	Direct Embed Foundations - 7' x 28'	1	EA	\$ 3,452	\$ 3,452	\$ 38,648	\$ 38,648	\$ 42,101	\$ 42,101

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.19	Direct Embed Foundations - 7' x 49'	1	EA	\$ 5,880	\$ 5,880	\$ 66,635	\$ 66,635	\$ 72,515	\$ 72,515
2.20	Direct Embed Foundations - 7' x 61'	1	EA	\$ 7,267	\$ 7,267	\$ 82,628	\$ 82,628	\$ 89,894	\$ 89,894
2.21	Drilled Pier - 6' x 20'	54	EA	\$ 18,064	\$ 975,459	\$ 18,261	\$ 986,079	\$ 36,325	\$ 1,961,539
2.22	Drilled Pier - 7' x 19'	15	EA	\$ 23,416	\$ 351,246	\$ 23,671	\$ 355,070	\$ 47,088	\$ 706,315
2.23	Drilled Pier - 7' x 21'	12	EA	\$ 25,758	\$ 309,096	\$ 26,038	\$ 312,461	\$ 51,796	\$ 621,558
2.24	Drilled Pier - 7' x 22'	6	EA	\$ 26,929	\$ 161,573	\$ 27,222	\$ 163,332	\$ 54,151	\$ 324,905
2.26	Drilled Pier - 7' x 23'	3	EA	\$ 28,100	\$ 84,299	\$ 28,406	\$ 85,217	\$ 56,505	\$ 169,516
2.27	Drilled Pier - 7' x 33'	6	EA	\$ 39,808	\$ 238,847	\$ 40,241	\$ 241,447	\$ 80,049	\$ 480,295
2.28	Drilled Pier - 7' x 42'	3	EA	\$ 50,345	\$ 151,036	\$ 50,893	\$ 152,680	\$ 101,239	\$ 303,716
2.29	Drilled Pier - 8' x 27'	2	EA	\$ 42,819	\$ 85,637	\$ 57,340	\$ 114,680	\$ 100,158	\$ 200,317
2.30	Drilled Pier - 8' x 29'	2	EA	\$ 45,877	\$ 91,754	\$ 61,436	\$ 122,871	\$ 107,313	\$ 214,625
2.31	Rock Excavation Adder	1,342	CY	\$ -	\$ -	\$ 2,000	\$ 2,684,000	\$ 2,000	\$ 2,684,000
<b>TOTAL - FOUNDATIONS:</b>					\$ 3,098,282		\$ 10,723,946		\$ 13,822,229
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 50,024	\$ 350,168	\$ 30,014	\$ 210,101	\$ 80,038	\$ 560,269
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 120'	4	Structure	\$ 52,207	\$ 208,828	\$ 31,324	\$ 125,297	\$ 83,531	\$ 334,125
3.3	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 130'	3	Structure	\$ 58,257	\$ 174,770	\$ 34,954	\$ 104,862	\$ 93,210	\$ 279,631
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 135'	10	Structure	\$ 60,884	\$ 608,835	\$ 36,530	\$ 365,301	\$ 97,414	\$ 974,136
3.5	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 145'	1	Structure	\$ 64,473	\$ 64,473	\$ 38,684	\$ 38,684	\$ 103,156	\$ 103,156
3.6	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 115'	1	Structure	\$ 72,039	\$ 72,039	\$ 43,223	\$ 43,223	\$ 115,262	\$ 115,262
3.7	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 130'	3	Structure	\$ 85,082	\$ 255,245	\$ 51,049	\$ 153,147	\$ 136,130	\$ 408,391
3.8	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 135'	1	Structure	\$ 92,278	\$ 92,278	\$ 55,367	\$ 55,367	\$ 147,645	\$ 147,645
3.9	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.10	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 120'	1	Structure	\$ 127,558	\$ 127,558	\$ 76,535	\$ 76,535	\$ 204,092	\$ 204,092
3.11	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 150'	1	Structure	\$ 208,033	\$ 208,033	\$ 124,820	\$ 124,820	\$ 332,852	\$ 332,852
3.12	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 160'	1	Structure	\$ 238,595	\$ 238,595	\$ 143,157	\$ 143,157	\$ 381,751	\$ 381,751
3.13	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 75'	1	Structure	\$ 24,476	\$ 24,476	\$ 14,685	\$ 14,685	\$ 39,161	\$ 39,161
3.14	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 80'	2	Structure	\$ 25,826	\$ 51,652	\$ 15,496	\$ 30,991	\$ 41,322	\$ 82,643
3.15	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 84'	169	Structure	\$ 29,526	\$ 4,989,894	\$ 17,716	\$ 2,993,936	\$ 47,242	\$ 7,983,830
3.16	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 89'	36	Structure	\$ 32,708	\$ 1,177,488	\$ 19,625	\$ 706,493	\$ 52,333	\$ 1,883,981
3.17	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 93'	23	Structure	\$ 34,540	\$ 794,409	\$ 20,724	\$ 476,645	\$ 55,263	\$ 1,271,054
3.18	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 98'	10	Structure	\$ 37,500	\$ 374,995	\$ 22,500	\$ 224,997	\$ 59,999	\$ 599,992
3.19	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 102'	4	Structure	\$ 43,901	\$ 175,602	\$ 26,340	\$ 105,361	\$ 70,241	\$ 280,963
3.20	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 107'	2	Structure	\$ 45,936	\$ 91,871	\$ 27,561	\$ 55,123	\$ 73,497	\$ 146,994
3.21	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 80'	2	Structure	\$ 55,241	\$ 110,482	\$ 33,145	\$ 66,289	\$ 88,386	\$ 176,771
3.22	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 85'	19	Structure	\$ 57,813	\$ 1,098,438	\$ 34,688	\$ 659,063	\$ 92,500	\$ 1,757,500
3.23	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 90'	2	Structure	\$ 61,050	\$ 122,100	\$ 36,630	\$ 73,260	\$ 97,680	\$ 195,360
3.24	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 95'	2	Structure	\$ 65,120	\$ 130,240	\$ 39,072	\$ 78,144	\$ 104,192	\$ 208,384
3.25	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 100'	1	Structure	\$ 68,635	\$ 68,635	\$ 41,181	\$ 41,181	\$ 109,816	\$ 109,816
3.26	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 105'	1	Structure	\$ 72,872	\$ 72,872	\$ 43,723	\$ 43,723	\$ 116,594	\$ 116,594
3.27	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 75'	2	Structure	\$ 61,513	\$ 123,025	\$ 36,908	\$ 73,815	\$ 98,420	\$ 196,840
3.28	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 80'	3	Structure	\$ 69,079	\$ 207,237	\$ 41,447	\$ 124,342	\$ 110,526	\$ 331,579
3.29	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 85'	4	Structure	\$ 75,739	\$ 302,956	\$ 45,443	\$ 181,774	\$ 121,182	\$ 484,730
3.30	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 90'	4	Structure	\$ 81,493	\$ 325,970	\$ 48,896	\$ 195,582	\$ 130,388	\$ 521,552
3.31	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 80'	1	Structure	\$ 97,403	\$ 97,403	\$ 58,442	\$ 58,442	\$ 155,844	\$ 155,844
3.32	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 85'	6	Structure	\$ 105,802	\$ 634,809	\$ 63,481	\$ 380,885	\$ 169,282	\$ 1,015,694
3.33	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 90'	6	Structure	\$ 117,253	\$ 703,518	\$ 70,352	\$ 422,111	\$ 187,605	\$ 1,125,629
3.34	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 95'	1	Structure	\$ 129,408	\$ 129,408	\$ 77,645	\$ 77,645	\$ 207,052	\$ 207,052
3.35	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 178,026	\$ 178,026	\$ 106,815	\$ 106,815	\$ 284,841	\$ 284,841
3.36	Remove Existing Foundation	50	EA	\$ -	\$ -	\$ 7,500	\$ 375,000	\$ 7,500	\$ 375,000
3.37	Remove Existing Structure and Accessories	994	EA	\$ -	\$ -	\$ 12,500	\$ 12,425,000	\$ 12,500	\$ 12,425,000
3.38	Install Grounding and Grounding Accessories	666	Pole	\$ 506	\$ 336,996	\$ 5,539	\$ 3,688,641	\$ 6,045	\$ 4,025,637
3.39									
3.40									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>TOTAL - STRUCTURES:</b>					\$ 14,839,646		\$ 25,190,231		\$ 40,029,876
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal" (Edic to 12.6 Miles)	2,228,688	LF	\$ 1.90	\$ 4,234,507	\$ 5.00	\$ 11,143,440	\$ 6.90	\$ 15,377,947
4.2	(1) OPGW 36 Fiber AC-33/38/571 (Edic to 12.6 Miles)	301,954	LF	\$ 1.35	\$ 407,638	\$ 5.00	\$ 1,509,770	\$ 6.35	\$ 1,917,408
4.3	(1) 3/8" EHS7 Steel (Edic to 12.6 Miles)	271,656	LF	\$ 0.47	\$ 127,678	\$ 5.00	\$ 1,358,280	\$ 5.47	\$ 1,485,958
4.4									
4.5									
4.6									
4.7	Remove Existing Conductor and Accessories	121.0	Mile	\$ -	\$ -	\$ 30,000	\$ 3,630,000	\$ 30,000.00	\$ 3,630,000
4.8	Remove Existing OPGW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.9	Remove Existing OHSW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.10									
4.11									
4.12									
4.13	Rider Poles (187 Locations)	93	Set	\$ 1,750	\$ 162,750	\$ 3,500	\$ 325,500	\$ 5,250.00	\$ 488,250
4.14	Rider Poles - Relocated	94	Set	\$ -	\$ -	\$ 3,500	\$ 329,000	\$ 3,500.00	\$ 329,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 4,932,573		\$ 20,897,590		\$ 25,830,163
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,276	Assembly	\$ 1,800	\$ 2,296,800	\$ 720	\$ 918,720	\$ 2,520	\$ 3,215,520
5.2	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.3		-	Assembly		\$ -		\$ -	\$ -	\$ -
5.4	OPGW Assembly - Tangent	304	Assembly	\$ 200	\$ 60,800	\$ 150	\$ 45,600	\$ 350	\$ 106,400
5.5	OPGW Assembly - Angle / DE	64	Assembly	\$ 250	\$ 16,000	\$ 150	\$ 9,600	\$ 400	\$ 25,600
5.6	OHSW Assembly - Tangent	274	Assembly	\$ 200	\$ 54,800	\$ 150	\$ 41,100	\$ 350	\$ 95,900
5.7	OHSW Assembly - Angle / DE	56	Assembly	\$ 250	\$ 14,000	\$ 150	\$ 8,400	\$ 400	\$ 22,400
5.8	OPGW Splice Boxes	27	Assembly	\$ 1,746	\$ 47,146	\$ 2,274	\$ 61,398	\$ 4,020	\$ 108,544
5.9	OPGW Splice & Test	27	EA	\$ 2,520	\$ 68,040	\$ 2,520	\$ 68,040	\$ 5,040	\$ 136,080
5.10	Spacer - Conductor	5,244	EA	\$ 50	\$ 262,200	\$ 35	\$ 183,540	\$ 85	\$ 445,740
5.11	Vibration Dampers - Conductor	4,164	EA	\$ 35	\$ 145,740	\$ 35	\$ 145,740	\$ 70	\$ 291,480
5.12	Shield wire / OPGW Dampers, Misc. Fittings	1,087	EA	\$ 27	\$ 29,349	\$ 35	\$ 38,045	\$ 62	\$ 67,394
5.13	Replace - Mono Pole Vertical Tangent (1-Group of 18-Bells Each Assembly)	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.14	Replace - Dead-end & Angle Insulators (1, Group of 18-Bells Each Assembly)	195	Assembly	\$ 1,800	\$ 351,000	\$ 720	\$ 140,400	\$ 2,520	\$ 491,400
5.15	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.16	Misc. materials (Signs and Markers)	66.8	Mile	\$ 770	\$ 51,436	\$ 1,006	\$ 67,201	\$ 1,776	\$ 118,637
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 5,125,311		\$ 2,418,984		\$ 7,544,295
<b>A. Transmission Line Edic to Princetown</b>					\$ 28,037,312		\$ 94,911,627		\$ 122,948,939
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,229,489	\$ 1,229,489	\$ 1,229,489	\$ 1,229,489
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 6,280,035	\$ 6,280,035	\$ 6,280,035	\$ 6,280,035
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,229,489	\$ 1,229,489	\$ 1,229,489	\$ 1,229,489
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,229,489	\$ 1,229,489	\$ 1,229,489	\$ 1,229,489
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 6,147,447	\$ 6,147,447	\$ 6,147,447	\$ 6,147,447
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 368,847	\$ 368,847	\$ 368,847	\$ 368,847
6.7	Geotech	67	Location	\$ -	\$ -	\$ 3,500	\$ 234,500	\$ 3,500	\$ 234,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 860,643	\$ 860,643	\$ 860,643	\$ 860,643
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 368,847	\$ 368,847	\$ 368,847	\$ 368,847
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 8,640,000	\$ 8,640,000	\$ 8,640,000	\$ 8,640,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Compensation for use of 1 Ckt - NYPA Structures (92 Structures)	1	LS	\$ -	\$ -	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123
6.18	Sales Tax on Materials	1	LS	\$ 2,242,985	\$ 2,242,985	\$ -	\$ -	\$ 2,242,985	\$ 2,242,985
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 122,949	\$ 122,949	\$ 122,949	\$ 122,949
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>						\$ 2,242,985		\$ 35,670,858	\$ 37,913,843

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**B. Transmission Line Princetown to Rotterdam**

Estimate  
Revision: 7

Total: \$ 25,026,832

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>B. Transmission Line Princetown to Rotterdam</b>			
1. CLEARING & ACCESS	\$ 6,000	\$ 3,038,200	\$ 3,044,200
2. FOUNDATIONS	\$ 417,002	\$ 3,778,708	\$ 4,195,711
3. STRUCTURES	\$ 3,876,135	\$ 4,280,943	\$ 8,157,078
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 722,365	\$ 2,620,705	\$ 3,343,070
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,199,031	\$ 549,192	\$ 1,748,223
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 497,643	\$ 4,040,907	\$ 4,538,550
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 6,718,177	\$ 18,308,655	\$ 25,026,832
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 6,718,177	\$ 18,308,655	\$ 25,026,832

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Princetown to Rotterdam</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	24.0	Acre	\$ -	\$ -	\$ 5,000	\$ 120,000	\$ 5,000	\$ 120,000
1.3	Permanent Access Road	5,280	LF	\$ -	\$ -	\$ 45	\$ 237,600	\$ 45	\$ 237,600
1.4	Silt Fence	26,400	LF	\$ -	\$ -	\$ 4	\$ 105,600	\$ 4	\$ 105,600
1.5	Matting - Access and ROW	21,120	LF	\$ -	\$ -	\$ 70	\$ 1,478,400	\$ 70	\$ 1,478,400
1.6	Matting - To Work Area	2,775	LF	\$ -	\$ -	\$ 70	\$ 194,250	\$ 70	\$ 194,250
1.7	Snow Removal	5	Mile	\$ -	\$ -	\$ 16,000	\$ 80,000	\$ 16,000	\$ 80,000
1.8	ROW Restoration	5	Mile	\$ -	\$ -	\$ 10,000	\$ 50,000	\$ 10,000	\$ 50,000
1.9	Work Pads	185,000	SF	\$ -	\$ -	\$ 4	\$ 651,200	\$ 4	\$ 651,200
1.10	Restoration for Work Pad areas	37,000	SF	\$ -	\$ -	\$ 0.2	\$ 5,550	\$ 0	\$ 5,550
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	10	EA	\$ -	\$ -	\$ 4,580	\$ 45,800	\$ 4,580	\$ 45,800
1.14	Maintenance and Protection of Traffic on Public Roads	10	EA	\$ -	\$ -	\$ 4,130	\$ 41,300	\$ 4,130	\$ 41,300
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 6,000		\$ 3,038,200		\$ 3,044,200
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 6' x 18'	56	EA	\$ 1,857	\$ 104,018	\$ 18,603	\$ 1,041,794	\$ 20,461	\$ 1,145,812
2.2	Direct Embed Foundations - 6' x 20'	4	EA	\$ 2,046	\$ 8,185	\$ 20,562	\$ 82,247	\$ 22,608	\$ 90,432
2.3	Direct Embed Foundations - 6' x 22'	8	EA	\$ 2,235	\$ 17,880	\$ 22,520	\$ 180,160	\$ 24,755	\$ 198,040
2.4	Direct Embed Foundations - 7' x 25'	4	EA	\$ 3,105	\$ 12,422	\$ 34,650	\$ 138,601	\$ 37,756	\$ 151,023
2.5	Drilled Pier - 6' x 19'	6	EA	\$ 17,204	\$ 103,223	\$ 17,391	\$ 104,347	\$ 34,595	\$ 207,570
2.6	Drilled Pier - 8' x 27'	4	EA	\$ 42,819	\$ 171,274	\$ 57,340	\$ 229,359	\$ 100,158	\$ 400,633
2.7	Rock Excavation Adder	1,001.1	CY	\$ -	\$ -	\$ 2,000	\$ 2,002,200	\$ 2,000	\$ 2,002,200
<b>TOTAL - FOUNDATIONS:</b>					\$ 417,002		\$ 3,778,708		\$ 4,195,711
<b>3. STRUCTURES</b>									
3.1	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 115'	24	Structure	\$ 85,544	\$ 2,053,056	\$ 51,326	\$ 1,231,834	\$ 136,870	\$ 3,284,890
3.2	2x 1-CKT 345KV DELTA TANGENT (0°-1°) - 135'	2	Structure	\$ 106,005	\$ 212,010	\$ 63,603	\$ 127,206	\$ 169,608	\$ 339,216
3.3	2x 1-CKT 345KV DELTA SMALL ANGLE (1°-15°) - 115'	2	Structure	\$ 141,673	\$ 283,346	\$ 85,004	\$ 170,008	\$ 226,677	\$ 453,354
3.4	2x 1-CKT 345KV VERTICAL TANGENT DEADEND (0°-5°) - 115'	4	Structure	\$ 109,816	\$ 439,264	\$ 65,890	\$ 263,558	\$ 175,706	\$ 702,822
3.5	2x 1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	2	Structure	\$ 232,656	\$ 465,312	\$ 139,594	\$ 279,187	\$ 372,250	\$ 744,499
3.6	2x 1-CKT 345KV 3-POLE LARGE ANGLE DEADEND (60°-90°) - 115'	1	Structure	\$ 176,342	\$ 176,342	\$ 105,805	\$ 105,805	\$ 282,147	\$ 282,147
3.7	2x 1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 65'	1	Structure	\$ 99,493	\$ 99,493	\$ 59,696	\$ 59,696	\$ 159,189	\$ 159,189
3.8	2x 1-CKT 345KV DELTA TANGENT (0°-1°) HD- 115'	1	Structure	\$ 105,820	\$ 105,820	\$ 63,492	\$ 63,492	\$ 169,312	\$ 169,312

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.9	Remove Existing Foundation	22	EA	\$ -	\$ -	\$ 7,500	\$ 163,500	\$ 7,500	\$ 163,500
3.10	Remove Existing Structure and Accessories	109	EA	\$ -	\$ -	\$ 12,500	\$ 1,362,500	\$ 12,500	\$ 1,362,500
3.11	Install Grounding and Grounding Accessories	82	Pole	\$ 506	\$ 41,492	\$ 5,539	\$ 454,157	\$ 6,045	\$ 495,649
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 3,876,135		\$ 4,280,943		\$ 8,157,078
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal" (R1 - R36)	339,293	LF	\$ 1.90	\$ 644,657	\$ 5.00	\$ 1,696,465	\$ 6.90	\$ 2,341,122
4.2	(1) OPGW 36 Fiber AC-33/38/571 (R1 - R36)	28,274	LF	\$ 1.35	\$ 38,170	\$ 5.00	\$ 141,370	\$ 6.35	\$ 179,540
4.3	(1) 3/8" EHS7 Steel (R1 - R36)	28,274	LF	\$ 0.47	\$ 13,289	\$ 5.00	\$ 141,370	\$ 5.47	\$ 154,659
4.5	Remove Existing Conductor and Accessories	10.0	Mile	\$ -	\$ -	\$ 30,000	\$ 300,000	\$ 30,000.00	\$ 300,000
4.6	Remove Existing OPGW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.7	Remove Existing OHSW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.8	Rider Poles	15	EA	\$ 1,750	\$ 26,250	\$ 3,500	\$ 52,500	\$ 5,250.00	\$ 78,750
4.9	Rider Poles - Relocated	14	Set	\$ -	\$ -	\$ 3,500	\$ 49,000	\$ 3,500.00	\$ 49,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 722,365		\$ 2,620,705		\$ 3,343,070
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	348	Assembly	\$ 1,800	\$ 626,400	\$ 720	\$ 250,560	\$ 2,520	\$ 876,960
5.2	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	240	Assembly	\$ 1,800	\$ 432,000	\$ 720	\$ 172,800	\$ 2,520	\$ 604,800
5.3	OPGW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.4	OPGW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.5	OHSW Assembly - Tangent	29	Assembly	\$ 200	\$ 5,800	\$ 150	\$ 4,350	\$ 350	\$ 10,150
5.6	OHSW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.7	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.8	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.9	Spacer - Conductor	1,002	EA	\$ 50	\$ 50,100	\$ 35	\$ 35,070	\$ 85	\$ 85,170
5.10	Vibration Dampers - Conductor	852	EA	\$ 35	\$ 29,820	\$ 35	\$ 29,820	\$ 70	\$ 59,640
5.11	Shieldwire / OPGW Dampers, Misc. Fittings	116	EA	\$ 27	\$ 3,132	\$ 35	\$ 4,060	\$ 62	\$ 7,192
5.12	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.13	Misc. materials (Signs and Markers)	5.0	Mile	\$ 770	\$ 3,850	\$ 1,006	\$ 5,030	\$ 1,776	\$ 8,880
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,199,031		\$ 549,192		\$ 1,748,223
<b>B. Transmission Line Princetown to Rotterdam</b>						\$ 6,220,534		\$ 14,267,748	\$ 20,488,282
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,046,509	\$ 1,046,509	\$ 1,046,509	\$ 1,046,509
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 204,883	\$ 204,883	\$ 204,883	\$ 204,883
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414	\$ 1,024,414
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.7	Geotech	5	Location	\$ -	\$ -	\$ 3,500	\$ 17,500	\$ 3,500	\$ 17,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 143,418	\$ 143,418	\$ 143,418	\$ 143,418
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 61,465	\$ 61,465	\$ 61,465	\$ 61,465
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000	\$ 1,011,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 497,643	\$ 497,643	\$ -	\$ -	\$ 497,643	\$ 497,643
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 20,488	\$ 20,488	\$ 20,488	\$ 20,488

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:					\$ 497,643		\$ 4,040,907		\$ 4,538,550

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**C. Transmission Line Princetown to New Scotland**

Estimate Revision: 7

Total: \$ 47,622,147

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>C. Transmission Line Princetown to New Scotland</b>			
1. CLEARING & ACCESS	\$ 31,000	\$ 11,223,694	\$ 11,254,694
2. FOUNDATIONS	\$ 1,194,705	\$ 4,499,949	\$ 5,694,653
3. STRUCTURES	\$ 6,879,617	\$ 5,578,039	\$ 12,457,656
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 1,564,842	\$ 4,756,290	\$ 6,321,132
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,767,073	\$ 847,291	\$ 2,614,365
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 914,979	\$ 8,364,668	\$ 9,279,647
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 12,352,215</b>	<b>\$ 35,269,931</b>	<b>\$ 47,622,147</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 12,352,215</b>	<b>\$ 35,269,931</b>	<b>\$ 47,622,147</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	26.0	Acre	\$ -	\$ -	\$ 15,000	\$ 390,000	\$ 15,000	\$ 390,000
1.2	Clearing the ROW - Light (mowing)	57.0	Acre	\$ -	\$ -	\$ 5,000	\$ 285,000	\$ 5,000	\$ 285,000
1.3	Permanent Access Road	20,803.2	LF	\$ -	\$ -	\$ 45	\$ 936,144	\$ 45	\$ 936,144
1.4	Silt Fence	104,016.0	LF	\$ -	\$ -	\$ 4	\$ 416,064	\$ 4	\$ 416,064
1.5	Matting - Access and ROW	83,212.8	LF	\$ -	\$ -	\$ 70	\$ 5,824,896	\$ 70	\$ 5,824,896
1.6	Matting - To Work Area	3,375.0	LF	\$ -	\$ -	\$ 70	\$ 236,250	\$ 70	\$ 236,250
1.7	Snow Removal	19.7	Mile	\$ -	\$ -	\$ 16,000	\$ 315,200	\$ 16,000	\$ 315,200
1.8	ROW Restoration	19.7	Mile	\$ -	\$ -	\$ 10,000	\$ 197,000	\$ 10,000	\$ 197,000
1.9	Work Pads	645,000.0	SF	\$ -	\$ -	\$ 4	\$ 2,270,400	\$ 4	\$ 2,270,400
1.10	Restoration for Work Pad areas	129,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 19,350	\$ 0	\$ 19,350
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	2	EA	\$ -	\$ -	\$ 14,445	\$ 28,890	\$ 14,445	\$ 28,890
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	50	EA	\$ -	\$ -	\$ 4,130	\$ 206,500	\$ 4,130	\$ 206,500
1.15	Gates	11	EA	\$ 2,000	\$ 22,000	\$ 2,500	\$ 27,500	\$ 4,500	\$ 49,500
1.16	Culverts / Misc. Access	12	EA	\$ 750	\$ 9,000	\$ 1,250	\$ 15,000	\$ 2,000	\$ 24,000
1.17	Concrete Washout Station	30	EA	\$ -	\$ -	\$ 1,850	\$ 55,500	\$ 1,850	\$ 55,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 31,000		\$ 11,223,694		\$ 11,254,694
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed Foundations - 4' x 16'	100	EA	\$ 941	\$ 94,073	\$ 7,398	\$ 739,787	\$ 8,339	\$ 833,860
2.2	Direct Embed Foundations - 4' x 19'	14	EA	\$ 1,104	\$ 15,455	\$ 8,703	\$ 121,847	\$ 9,807	\$ 137,302
2.3	Direct Embed Foundations - 4' x 21'	2	EA	\$ 1,213	\$ 2,425	\$ 9,574	\$ 19,147	\$ 10,786	\$ 21,573
2.4	Direct Embed Foundations - 6' x 18'	9	EA	\$ 1,857	\$ 16,717	\$ 18,603	\$ 167,431	\$ 20,461	\$ 184,148
2.5	Direct Embed Foundations - 6' x 20'	14	EA	\$ 2,046	\$ 28,648	\$ 20,562	\$ 287,864	\$ 22,608	\$ 316,512
2.6	Direct Embed Foundations - 6' x 21'	25	EA	\$ 2,141	\$ 53,516	\$ 21,541	\$ 538,521	\$ 23,681	\$ 592,037
2.7	Direct Embed Foundations - 6' x 22'	4	EA	\$ 2,235	\$ 8,940	\$ 22,520	\$ 90,080	\$ 24,755	\$ 99,020
2.8	Direct Embed Foundations - 6' x 25'	5	EA	\$ 2,518	\$ 12,591	\$ 25,457	\$ 127,287	\$ 27,976	\$ 139,878
2.9	Direct Embed Foundations - 6' x 29'	1	EA	\$ 2,896	\$ 2,896	\$ 29,374	\$ 29,374	\$ 32,270	\$ 32,270
2.10	Direct Embed Foundations - 6' x 34'	4	EA	\$ 3,273	\$ 13,093	\$ 33,290	\$ 133,162	\$ 36,564	\$ 146,255
2.11	Direct Embed Foundations - 6' x 42'	3	EA	\$ 4,123	\$ 12,369	\$ 42,103	\$ 126,308	\$ 46,225	\$ 138,676
2.12	Direct Embed Foundations - 7' x 25'	1	EA	\$ 3,105	\$ 3,105	\$ 34,650	\$ 34,650	\$ 37,756	\$ 37,756
2.13	Direct Embed Foundations - 7' x 27'	1	EA	\$ 3,337	\$ 3,337	\$ 37,316	\$ 37,316	\$ 40,652	\$ 40,652
2.14	Direct Embed Foundations - 7' x 28'	1	EA	\$ 3,452	\$ 3,452	\$ 38,648	\$ 38,648	\$ 42,101	\$ 42,101
2.15	Drilled Pier - 6' x 20'	6	EA	\$ 18,064	\$ 108,384	\$ 18,261	\$ 109,564	\$ 36,325	\$ 217,949
2.16	Drilled Pier - 7' x 19'	15	EA	\$ 23,416	\$ 351,246	\$ 23,671	\$ 355,070	\$ 47,088	\$ 706,315
2.17	Drilled Pier - 7' x 24'	3	EA	\$ 29,270	\$ 87,811	\$ 29,589	\$ 88,767	\$ 58,860	\$ 176,579
2.18	Drilled Pier - 8' x 27'	1	EA	\$ 42,819	\$ 42,819	\$ 43,285	\$ 43,285	\$ 86,103	\$ 86,103
2.19	Drilled Pier - 8' x 83'	1	EA	\$ 128,456	\$ 128,456	\$ 172,020	\$ 172,020	\$ 300,475	\$ 300,475
2.20	Drilled Pier - 8' x 89'	1	EA	\$ 137,631	\$ 137,631	\$ 184,307	\$ 184,307	\$ 321,938	\$ 321,938
2.21	Drilled Pier - 9' x 34'	1	EA	\$ 67,740	\$ 67,740	\$ 90,713	\$ 90,713	\$ 158,454	\$ 158,454

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.22	Rock Excavation Adder	482.40	CY	\$ -	\$ -	\$ 2,000	\$ 964,800	\$ 2,000	\$ 964,800
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,194,705		\$ 4,499,949		\$ 5,694,653
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 50,024	\$ 350,168	\$ 30,014	\$ 210,101	\$ 80,038	\$ 560,269
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 120'	5	Structure	\$ 52,207	\$ 261,035	\$ 31,324	\$ 156,621	\$ 83,531	\$ 417,656
3.3	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 125'	8	Structure	\$ 55,685	\$ 445,480	\$ 33,411	\$ 267,288	\$ 89,096	\$ 712,768
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 130'	9	Structure	\$ 58,257	\$ 524,309	\$ 34,954	\$ 314,585	\$ 93,210	\$ 838,894
3.5	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 135'	4	Structure	\$ 60,884	\$ 243,534	\$ 36,530	\$ 146,120	\$ 97,414	\$ 389,654
3.6	1-CKT 345KV VERTICAL TANGENT (0°-1°) - 145'	1	Structure	\$ 64,473	\$ 64,473	\$ 38,684	\$ 38,684	\$ 103,156	\$ 103,156
3.7	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 115'	1	Structure	\$ 72,039	\$ 72,039	\$ 43,223	\$ 43,223	\$ 115,262	\$ 115,262
3.8	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°) - 135'	1	Structure	\$ 92,278	\$ 92,278	\$ 55,367	\$ 55,367	\$ 147,645	\$ 147,645
3.9	1-CKT 345KV VERTICAL TANGENT DEADEND (0°-5°) - 120'	1	Structure	\$ 58,164	\$ 58,164	\$ 34,898	\$ 34,898	\$ 93,062	\$ 93,062
3.10	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 105'	1	Structure	\$ 98,883	\$ 98,883	\$ 59,330	\$ 59,330	\$ 158,212	\$ 158,212
3.11	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 84'	43	Structure	\$ 29,526	\$ 1,269,618	\$ 17,716	\$ 761,771	\$ 47,242	\$ 2,031,389
3.12	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 89'	5	Structure	\$ 32,708	\$ 163,540	\$ 19,625	\$ 98,124	\$ 52,333	\$ 261,664
3.13	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 93'	5	Structure	\$ 34,540	\$ 172,698	\$ 20,724	\$ 103,619	\$ 55,263	\$ 276,316
3.14	1-CKT 345KV H-FRAME TANGENT (0°-1°) - 107'	5	Structure	\$ 45,936	\$ 229,678	\$ 27,561	\$ 137,807	\$ 73,497	\$ 367,484
3.15	1-CKT 345KV H-FRAME SMALL ANGLE (1°-15°) - 80'	3	Structure	\$ 55,241	\$ 165,723	\$ 33,145	\$ 99,434	\$ 88,386	\$ 265,157
3.16	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 80'	5	Structure	\$ 69,079	\$ 345,395	\$ 41,447	\$ 207,237	\$ 110,526	\$ 552,632
3.17	1-CKT 345KV 3-POLE TANGENT DEADEND (0°-5°) - 85'	1	Structure	\$ 75,739	\$ 75,739	\$ 45,443	\$ 45,443	\$ 121,182	\$ 121,182
3.18	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 80'	5	Structure	\$ 97,403	\$ 487,013	\$ 58,442	\$ 292,208	\$ 155,844	\$ 779,220
3.19	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 95'	1	Structure	\$ 129,408	\$ 129,408	\$ 77,645	\$ 77,645	\$ 207,052	\$ 207,052
3.20	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 178,026	\$ 178,026	\$ 106,815	\$ 106,815	\$ 284,841	\$ 284,841
3.21	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 115'	7	Structure	\$ 54,631	\$ 382,414	\$ 32,778	\$ 229,448	\$ 87,409	\$ 611,862
3.22	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 125'	4	Structure	\$ 62,604	\$ 250,416	\$ 37,562	\$ 150,250	\$ 100,166	\$ 400,666
3.23	2-CKT 115KV/345KV VERTICAL TANGENT (0°-1°) - 135'	1	Structure	\$ 68,894	\$ 68,894	\$ 41,336	\$ 41,336	\$ 110,230	\$ 110,230
3.24	2-CKT 115KV/345KV VERTICAL SMALL ANGLE (1°-15°) - 155'	1	Structure	\$ 149,480	\$ 149,480	\$ 89,688	\$ 89,688	\$ 239,168	\$ 239,168
3.25	2-CKT 115KV/345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 173,808	\$ 173,808	\$ 104,285	\$ 104,285	\$ 278,092	\$ 278,092
3.26	2-CKT 115KV/345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 125'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.27	115KV DUMMY DE, Drilled Pier, 85'	2	Structure	\$ 58,164	\$ 116,328	\$ 34,898	\$ 69,797	\$ 93,062	\$ 186,125
3.28	Remove Existing Foundation	4	EA	\$ -	\$ -	\$ 7,500	\$ 30,000	\$ 7,500	\$ 30,000
3.29	Remove Existing Structure and Accessories	24	EA	\$ -	\$ -	\$ 12,500	\$ 300,000	\$ 12,500	\$ 300,000
3.30	Install Grounding and Grounding Accessories	214	Pole	\$ 506	\$ 108,284	\$ 5,539	\$ 1,185,239	\$ 6,045	\$ 1,293,523
<b>TOTAL - STRUCTURES:</b>					\$ 6,879,617		\$ 5,578,039		\$ 12,457,656
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal" (ENS-336 to ENS-464)	661,954	LF	\$ 1.90	\$ 1,257,713	\$ 5.00	\$ 3,309,770	\$ 6.90	\$ 4,567,483
4.2	(1) OPGW 36 Fiber AC-33/38/571 (ENS-336 to ENS-464)	110,326	LF	\$ 1.35	\$ 148,940	\$ 5.00	\$ 551,630	\$ 6.35	\$ 700,570
4.3	(1) 3/8" EHS7 Steel (ENS-336 to ENS-464)	75,398	LF	\$ 0.47	\$ 35,437	\$ 5.00	\$ 376,990	\$ 5.47	\$ 412,427
4.4		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.5	115KV - (1) 954kcmil 54/7 ACSS "Cardinal" (ENS-336 to ENS-464)	41,580	LF	\$ 1.90	\$ 79,002	\$ 5.00	\$ 207,900	\$ 6.90	\$ 286,902
4.6	(1) OPGW 36 Fiber AC-33/38/571 (ENS-336 to ENS-464)	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.7	(1) 3/8" EHS7 Steel (ENS-336 to ENS-464)	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.8	Remove Existing Conductor and Accessories	2.5	Mile	\$ -	\$ -	\$ 30,000	\$ 75,000	\$ 30,000.00	\$ 75,000
4.9	Remove Existing OPGW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.10	Remove Existing OHSW and Accessories	2.5	Mile	\$ -	\$ -	\$ 12,000	\$ 30,000	\$ 12,000.00	\$ 30,000
4.11	Rider Poles (50 Locations)	25	Set	\$ 1,750	\$ 43,750	\$ 3,500	\$ 87,500	\$ 5,250.00	\$ 131,250
4.12	Rider Poles - Relocated	25	Set	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500.00	\$ 87,500
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 1,564,842		\$ 4,756,290		\$ 6,321,132
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345KV Tangent (1-Group of 18-Bells Each Assembly)	538	Assembly	\$ 1,800	\$ 968,400	\$ 720	\$ 387,360	\$ 2,520	\$ 1,355,760
5.2	115KV Tangent (1-Group of 9-Bells Each Assembly)	78	Assembly	\$ 900	\$ 70,200	\$ 560	\$ 43,680	\$ 1,460	\$ 113,880
5.3	345KV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	255	Assembly	\$ 1,800	\$ 459,000	\$ 720	\$ 183,600	\$ 2,520	\$ 642,600
5.4	115KV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	21	Assembly	\$ 900	\$ 18,900	\$ 560	\$ 11,760	\$ 1,460	\$ 30,660
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.7	OPGW Assembly - Tangent	110	Assembly	\$ 200	\$ 22,000	\$ 150	\$ 16,500	\$ 350	\$ 38,500
5.8	OPGW Assembly - Angle / DE	34	Assembly	\$ 250	\$ 8,500	\$ 150	\$ 5,100	\$ 400	\$ 13,600

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.9	OHSW Assembly - Tangent	61	Assembly	\$ 200	\$ 12,200	\$ 150	\$ 9,150	\$ 350	\$ 21,350
5.10	OHSW Assembly - Angle / DE	24	Assembly	\$ 250	\$ 6,000	\$ 150	\$ 3,600	\$ 400	\$ 9,600
5.11	OPGW Splice Boxes	8	Assembly	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.12	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.13	Spacer - Conductor	1,773	EA	\$ 50	\$ 88,650	\$ 35	\$ 62,055	\$ 85	\$ 150,705
5.14	Vibration Dampers - Conductor	1,596	EA	\$ 35	\$ 55,860	\$ 35	\$ 55,860	\$ 70	\$ 111,720
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	293	EA	\$ 27	\$ 7,911	\$ 35	\$ 10,255	\$ 62	\$ 18,166
5.16	Guys, Anchors, and Accessories	-	EA	\$ 912	\$ -	\$ 1,058	\$ -	\$ 1,970	\$ -
5.17	Misc. materials (Signs and Markers)	19.9	Mile	\$ 770	\$ 15,323	\$ 1,006	\$ 20,019	\$ 1,776	\$ 35,342
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,767,073		\$ 847,291		\$ 2,614,365
<b>C. Transmission Line Princetown to New Scotland</b>					\$ 11,437,237		\$ 26,905,263		\$ 38,342,499
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,958,474	\$ 1,958,474	\$ 1,958,474	\$ 1,958,474
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 383,425	\$ 383,425	\$ 383,425	\$ 383,425
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,917,125	\$ 1,917,125	\$ 1,917,125	\$ 1,917,125
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 115,027	\$ 115,027	\$ 115,027	\$ 115,027
6.7	Geotech	20	Location	\$ -	\$ -	\$ 3,500	\$ 70,000	\$ 3,500	\$ 70,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 268,397	\$ 268,397	\$ 268,397	\$ 268,397
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 115,027	\$ 115,027	\$ 115,027	\$ 115,027
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 215,000	\$ 215,000	\$ 215,000	\$ 215,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,477,000	\$ 2,477,000	\$ 2,477,000	\$ 2,477,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 914,979	\$ 914,979	\$ -	\$ -	\$ 914,979	\$ 914,979
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 38,342	\$ 38,342	\$ 38,342	\$ 38,342
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 914,979		\$ 8,364,668		\$ 9,279,647

**NAT & NYPA - T026 - (Segment A, Base)**

**D. Rotterdam Substation - Install**

Estimate Revision: **7**

Total: \$ **55,770,077**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>D. Rotterdam Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,896,891	\$ 8,763,755	\$ 11,660,646
2. SUBSTATION FOUNDATIONS	\$ 2,443,003	\$ 2,616,200	\$ 5,059,203
3. SUBSTATION STRUCTURES	\$ 944,980	\$ 944,980	\$ 1,889,960
4. MAJOR EQUIPMENT	\$ 11,915,000	\$ 2,970,000	\$ 14,885,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,994,540	\$ 1,060,500	\$ 3,055,040
6. CONTROL HOUSE / PANELS	\$ 2,927,500	\$ 1,477,500	\$ 4,405,000
7. MISC ITEMS	\$ 1,441,675	\$ 2,331,950	\$ 3,773,625
8. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,965,087	\$ 9,076,516	\$ 11,041,603
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 26,528,676	\$ 29,241,401	\$ 55,770,077
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 26,528,676	\$ 29,241,401	\$ 55,770,077

0.0%

0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Rotterdam Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	7.4	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,497,125	\$ 203,000	\$ 1,497,125
1.2	Station stone within substation fence.	3,175	CY	\$ 27	\$ 85,725	\$ 75	\$ 238,125	\$ 102	\$ 323,850
1.3	Substation Fence	2,130	LF	\$ 100	\$ 213,000	\$ 100	\$ 213,000	\$ 200	\$ 426,000
1.4	Retaining Wall (1065' x 13')	1	LS	\$ 406,755	\$ 406,755	\$ 925,345	\$ 925,345	\$ 1,332,100	\$ 1,332,100
1.5	Compacted Fill (124,583cy Sand)	124,583	CY	\$ 17	\$ 2,117,911	\$ 20	\$ 2,491,660	\$ 37	\$ 4,609,571
1.6	Permanent Access Road - 20'-Wide (From Gordon RD)	2,100	LF	\$ 35	\$ 73,500	\$ 285	\$ 598,500	\$ 320	\$ 672,000
1.7	Natural Gas Transmission Line Relocation	1	LS	\$ -		\$ 2,800,000	\$ 2,800,000	\$ 2,800,000	\$ 2,800,000
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,896,891		\$ 8,763,755		\$ 11,660,646
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345KV</b>									
2.1a	Circuit Breaker Foundations	8	EA	\$ 14,940	\$ 119,520	\$ 16,000	\$ 128,000	\$ 30,940	\$ 247,520
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	32	EA	\$ 26,145	\$ 836,640	\$ 28,000	\$ 896,000	\$ 54,145	\$ 1,732,640
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	102	EA	\$ 4,482	\$ 457,164	\$ 4,800	\$ 489,600	\$ 9,282	\$ 946,764
2.1f	Station Service Transformer Stand Foundation	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	42	EA	\$ 4,482	\$ 188,244	\$ 4,800	\$ 201,600	\$ 9,282	\$ 389,844
2.1j	Instrument Transformer Stand Foundations	33	EA	\$ 4,482	\$ 147,906	\$ 4,800	\$ 158,400	\$ 9,282	\$ 306,306

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	1	EA	\$ 11,952	\$ 11,952	\$ 12,800	\$ 12,800	\$ 24,752	\$ 24,752
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 22,410	\$ 89,640	\$ 24,000	\$ 96,000	\$ 46,410	\$ 185,640
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	8	EA	\$ 3,735	\$ 29,880	\$ 4,000	\$ 32,000	\$ 7,735	\$ 61,880
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	9	EA	\$ 3,735	\$ 33,615	\$ 4,000	\$ 36,000	\$ 7,735	\$ 69,615
2.2k	Arrester Stand Foundations	3	EA	\$ 3,735	\$ 11,205	\$ 4,000	\$ 12,000	\$ 7,735	\$ 23,205
2.2m	Wave Trap Stand Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 16,434	\$ 65,736	\$ 17,600	\$ 70,400	\$ 34,034	\$ 136,136
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.4b	345-115kV Transformer Foundation w/ Oil Containment	2	EA	\$ 74,700	\$ 149,400	\$ 80,000	\$ 160,000	\$ 154,700	\$ 309,400
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 97,110	\$ 97,110	\$ 104,000	\$ 104,000	\$ 201,110	\$ 201,110
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 2,443,003		\$ 2,616,200		\$ 5,059,203
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	8	EA	\$ 37,000	\$ 296,000	\$ 37,000	\$ 296,000	\$ 74,000	\$ 592,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	17	EA	\$ 14,800	\$ 251,600	\$ 14,800	\$ 251,600	\$ 29,600	\$ 503,200
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	42	EA	\$ 3,700	\$ 155,400	\$ 3,700	\$ 155,400	\$ 7,400	\$ 310,800
3.1g	Instrument Transformer Stand	33	EA	\$ 1,850	\$ 61,050	\$ 1,850	\$ 61,050	\$ 3,700	\$ 122,100
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ 33,300	\$ 33,300	\$ 33,300	\$ 33,300	\$ 66,600	\$ 66,600
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	2	EA	\$ 12,025	\$ 24,050	\$ 12,025	\$ 24,050	\$ 24,050	\$ 48,100
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	9	EA	\$ 1,295	\$ 11,655	\$ 1,295	\$ 11,655	\$ 2,590	\$ 23,310
3.2h	Arrester Stand	3	EA	\$ 1,295	\$ 3,885	\$ 1,295	\$ 3,885	\$ 2,590	\$ 7,770
3.2j	Wave Trap Stand	1	EA	\$ 5,550	\$ 5,550	\$ 5,550	\$ 5,550	\$ 11,100	\$ 11,100
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	2	EA	\$ 7,955	\$ 15,910	\$ 7,955	\$ 15,910	\$ 15,910	\$ 31,820
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 944,980		\$ 944,980		\$ 1,889,960
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	8	EA	\$ 200,000	\$ 1,600,000	\$ 80,000	\$ 640,000	\$ 280,000	\$ 2,240,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	1	EA	\$ 3,400,000	\$ 3,400,000	\$ 750,000	\$ 750,000	\$ 4,150,000	\$ 4,150,000
4.1d	345 kV - 115 kV Auto Transformer	2	EA	\$ 3,400,000	\$ 6,800,000	\$ 750,000	\$ 1,500,000	\$ 4,150,000	\$ 8,300,000
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	1	EA	\$ 115,000	\$ 115,000	\$ 80,000	\$ 80,000	\$ 195,000	\$ 195,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 11,915,000		\$ 2,970,000		\$ 14,885,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000
5.1b	Disconnect Switches - 3ph w/ manual operator	17	EA	\$ 35,000	\$ 595,000	\$ 17,500	\$ 297,500	\$ 52,500	\$ 892,500
5.1c	VT'S	6	EA	\$ 25,000	\$ 150,000	\$ 12,000	\$ 72,000	\$ 37,000	\$ 222,000
5.1d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1e	CCVT'S	21	EA	\$ 13,000	\$ 273,000	\$ 8,000	\$ 168,000	\$ 21,000	\$ 441,000
5.1f	Arresters	15	EA	\$ 6,500	\$ 97,500	\$ 1,500	\$ 22,500	\$ 8,000	\$ 120,000
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	1	EA	\$ 35,000	\$ 35,000	\$ 15,000	\$ 15,000	\$ 50,000	\$ 50,000
5.2b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 30,000	\$ 30,000	\$ 17,500	\$ 17,500	\$ 47,500	\$ 47,500
5.2c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.2e	CCVT'S	3	EA	\$ 10,000	\$ 30,000	\$ 6,000	\$ 18,000	\$ 16,000	\$ 48,000
5.2f	Arresters	6	EA	\$ 5,000	\$ 30,000	\$ 6,000	\$ 36,000	\$ 11,000	\$ 66,000
5.2g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	2	EA	\$ 8,000	\$ 16,000	\$ 8,000	\$ 16,000	\$ 16,000	\$ 32,000
5.3f	Arresters	12	EA	\$ 3,420	\$ 41,040	\$ 6,000	\$ 72,000	\$ 9,420	\$ 113,040
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,994,540		\$ 1,060,500		\$ 3,055,040
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 975,000	\$ 975,000	\$ 170,000	\$ 170,000	\$ 1,145,000	\$ 1,145,000
6.2	Protection and Telecom Equipment Panels	29	EA	\$ 35,000	\$ 1,015,000	\$ 10,000	\$ 290,000	\$ 45,000	\$ 1,305,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 472,500	\$ 472,500	\$ 472,500	\$ 472,500	\$ 945,000	\$ 945,000
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,927,500		\$ 1,477,500		\$ 4,405,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,950	LF	\$ 185.00	\$ 360,750	\$ 170.00	\$ 331,500	\$ 355	\$ 692,250
7.2	Rigid Bus, Fittings & Insulators	2,500	LF	\$ 125.07	\$ 312,675	\$ 237.10	\$ 592,750	\$ 362	\$ 905,425
7.3	Strain Bus, Connectors & Insulators	2,000	LF	\$ 39.30	\$ 78,600	\$ 53.35	\$ 106,700	\$ 93	\$ 185,300
7.4	Grounding System	25,000	LF	\$ 6.93	\$ 173,250	\$ 32.58	\$ 814,500	\$ 40	\$ 987,750
7.5	Strain Bus Insulators - 345kV	48	EA	\$ 2,000	\$ 96,000	\$ 1,050	\$ 50,400	\$ 3,050	\$ 146,400
7.6	Strain Bus Insulators - 230kV	6	EA	\$ 1,400	\$ 8,400	\$ 750	\$ 4,500	\$ 2,150	\$ 12,900
7.7	Strain Bus Insulators - 115kV	12	EA	\$ 1,000	\$ 12,000	\$ 550	\$ 6,600	\$ 1,550	\$ 18,600
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
<b>TOTAL - MISC ITEMS</b>					\$ 1,441,675		\$ 2,331,950		\$ 3,773,625
<b>D. Rotterdam Substation - Install</b>					\$ 24,563,589		\$ 20,164,885		\$ 44,728,474
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,284,659	\$ 2,284,659	\$ 2,284,659	\$ 2,284,659
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 447,285	\$ 447,285	\$ 447,285	\$ 447,285
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,578,278	\$ 3,578,278	\$ 3,578,278	\$ 3,578,278
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 313,099	\$ 313,099	\$ 313,099	\$ 313,099
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,118,212	\$ 1,118,212	\$ 1,118,212	\$ 1,118,212

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 134,185	\$ 134,185	\$ 134,185	\$ 134,185
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 247,500	\$ 247,500	\$ 247,500	\$ 247,500
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,965,087	\$ 1,965,087	\$ -	\$ -	\$ 1,965,087	\$ 1,965,087
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 44,728	\$ 44,728	\$ 44,728	\$ 44,728
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,965,087		\$ 9,076,516		\$ 11,041,603

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**E. Rotterdam Substation - Removal**

Estimate Revision: **7** Total: \$ **4,207,133**

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>E. Rotterdam Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 1,472,750	\$ 1,472,750
2. SUBSTATION FOUNDATIONS	\$ -	\$ 617,400	\$ 617,400
3. SUBSTATION STRUCTURES	\$ -	\$ 534,900	\$ 534,900
4. MAJOR EQUIPMENT	\$ -	\$ 147,000	\$ 147,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 169,500	\$ 169,500
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 519,480	\$ 519,480
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 596,103	\$ 596,103
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 4,207,133	\$ 4,207,133
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 4,207,133	\$ 4,207,133

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>E. Rotterdam Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	6.3	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,268,750	\$ 203,000	\$ 1,268,750
1.2	Station stone within substation fence.	2,000	CY	\$ -	\$ -	\$ 102	\$ 204,000	\$ 102	\$ 204,000
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 1,472,750		\$ 1,472,750
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	9	EA	\$ -	\$ -	\$ 7,200	\$ 64,800	\$ 7,200	\$ 64,800
2.2b	Capacitor Bank Foundations	2	EA	\$ -	\$ -	\$ 32,000	\$ 64,000	\$ 32,000	\$ 64,000
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	1	EA	\$ -	\$ -	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	15	EA	\$ -	\$ -	\$ 5,200	\$ 78,000	\$ 5,200	\$ 78,000
2.2f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	4	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	59	EA	\$ -	\$ -	\$ 2,400	\$ 141,600	\$ 2,400	\$ 141,600
2.2j	Instrument Transformer Stand Foundations	15	EA	\$ -	\$ -	\$ 2,400	\$ 36,000	\$ 2,400	\$ 36,000
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	3	EA	\$ -	\$ -	\$ 42,000	\$ 126,000	\$ 42,000	\$ 126,000
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 617,400		\$ 617,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	1	EA	\$ -	\$ -	\$ 27,000	\$ 27,000	\$ 27,000	\$ 27,000
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	15	EA	\$ -	\$ -	\$ 9,750	\$ 146,250	\$ 9,750	\$ 146,250
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	4	EA	\$ -	\$ -	\$ 2,250	\$ 9,000	\$ 2,250	\$ 9,000
3.2f	Bus Support 1 Ph	59	EA	\$ -	\$ -	\$ 2,250	\$ 132,750	\$ 2,250	\$ 132,750
3.2g	Instrument Transformer Stand	15	EA	\$ -	\$ -	\$ 1,050	\$ 15,750	\$ 1,050	\$ 15,750
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	3	EA	\$ -	\$ -	\$ 4,500	\$ 13,500	\$ 4,500	\$ 13,500
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 534,900		\$ 534,900
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	9	EA	\$ -	\$ -	\$ 7,000	\$ 63,000	\$ 7,000	\$ 63,000
4.2b	Capacitor Banks	2	EA	\$ -	\$ -	\$ 42,000	\$ 84,000	\$ 42,000	\$ 84,000
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 147,000		\$ 147,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2b	Disconnect Switches - 3ph w/ manual operator	12	EA	\$ -	\$ -	\$ 5,500	\$ 66,000	\$ 5,500	\$ 66,000
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	8	EA	\$ -	\$ -	\$ 1,500	\$ 12,000	\$ 1,500	\$ 12,000
5.2f	Arresters	15	EA	\$ -	\$ -	\$ 2,500	\$ 37,500	\$ 2,500	\$ 37,500
5.2g	Wave Traps	3	EA	\$ -	\$ -	\$ 2,500	\$ 7,500	\$ 2,500	\$ 7,500
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 169,500		\$ 169,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	PANELS	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Protection and Telecom Equipment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.2	Rigid Bus, Fittings & Insulators	3,200	LF	\$ -	\$ -	\$ 126.25	\$ 404,000	\$ 126	\$ 404,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.3	Strain Bus, Connectors & Insulators	800	LF	\$ -	\$ -	\$ 39.35	\$ 31,480	\$ 39	\$ 31,480
7.4	Grounding System	1	LS	\$ -	\$ -	\$ 42,000.00	\$ 42,000	\$ 42,000	\$ 42,000
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 519,480		\$ 519,480
<b>E. Rotterdam Substation - Removal</b>					\$ -		\$ 3,611,030		\$ 3,611,030
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 184,446	\$ 184,446	\$ 184,446	\$ 184,446
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 36,110	\$ 36,110	\$ 36,110	\$ 36,110
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 288,882	\$ 288,882	\$ 288,882	\$ 288,882
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 25,277	\$ -	\$ 25,277	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 90,276	\$ -	\$ 90,276	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 10,833	\$ 10,833	\$ 10,833	\$ 10,833
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 3,611	\$ 3,611	\$ 3,611	\$ 3,611
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 596,103		\$ 596,103

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**F. Edic Substation - Install**

Estimate Revision: **7**

Total: \$ **2,639,615**

<i>NAT &amp; NYPA - T028 - (Segment A, Enhanced)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>F. Edic Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,025	\$ 5,625	\$ 7,650
2. SUBSTATION FOUNDATIONS	\$ 100,098	\$ 107,200	\$ 207,298
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 280,000	\$ 133,500	\$ 413,500
6. CONTROL HOUSE / PANELS	\$ 173,850	\$ 98,850	\$ 272,700
7. MISC ITEMS	\$ 339,357	\$ 507,880	\$ 847,237
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 91,178	\$ 431,251	\$ 522,430
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,230,908	\$ 1,408,706	\$ 2,639,615
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,230,908	\$ 1,408,706	\$ 2,639,615

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Edic Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,025		\$ 5,625		\$ 7,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2f	Fuse Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 100,098		\$ 107,200		\$ 207,298
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 280,000		\$ 133,500		\$ 413,500

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 10,000	\$ 30,000	\$ 45,000	\$ 135,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 68,850	\$ 68,850	\$ 68,850	\$ 68,850	\$ 137,700	\$ 137,700
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 173,850		\$ 98,850		\$ 272,700
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	L.S.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 39.30	\$ 98,250	\$ 53.35	\$ 133,375	\$ 93	\$ 231,625
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 73,305.00	\$ 73,305	\$ 83,700	\$ 83,700
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 339,357		\$ 507,880		\$ 847,237
<b>F. Edic Substation - Install</b>					\$ 1,139,730		\$ 977,455		\$ 2,117,185
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 108,142	\$ 108,142	\$ 108,142	\$ 108,142
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 21,172	\$ 21,172	\$ 21,172	\$ 21,172
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 169,375	\$ 169,375	\$ 169,375	\$ 169,375
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,820	\$ 14,820	\$ 14,820	\$ 14,820
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,930	\$ 52,930	\$ 52,930	\$ 52,930
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,352	\$ 6,352	\$ 6,352	\$ 6,352
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 91,178	\$ 91,178	\$ -	\$ -	\$ 91,178	\$ 91,178
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,117	\$ 2,117	\$ 2,117	\$ 2,117
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 91,178		\$ 431,251		\$ 522,430

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**G. Edic Substation - Removal**

Estimate Revision: **7**

Total: \$ **41,616**

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>G. Edic Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 14,000	\$ 14,000
3. SUBSTATION STRUCTURES	\$ -	\$ 6,750	\$ 6,750
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ 10,500
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 5,866	\$ 5,866
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 31,116	\$ 41,616
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 31,116	\$ 41,616

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Edic Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 14,000	\$ 14,000	\$ 14,000	\$ 14,000
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 14,000		\$ 14,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	3	EA	\$ -	\$ -	\$ 2,250	\$ 6,750	\$ 2,250	\$ 6,750
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 6,750		\$ 6,750
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 10,500.00	\$ 10,500	\$ 10,500	\$ 10,500
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 10,500		\$ 10,500
<b>G. Edic Substation - Removal</b>					\$ -		\$ 35,750		\$ 35,750
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 358	\$ 358	\$ 358	\$ 358
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,826	\$ 1,826	\$ 1,826	\$ 1,826
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 358	\$ 358	\$ 358	\$ 358
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 358	\$ 358	\$ 358	\$ 358
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,860	\$ 2,860	\$ 2,860	\$ 2,860
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 250	\$ -	\$ 250	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 894	\$ -	\$ 894	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 107	\$ 107	\$ 107	\$ 107
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ 36	\$ -	\$ 36	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 5,866		\$ 5,866

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**H. New Scotland Substation - Install**

Estimate Revision: **7**

Total: \$ **6,443,406**

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>H. New Scotland Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 4,050	\$ 11,250	\$ 15,300
2. SUBSTATION FOUNDATIONS	\$ 406,368	\$ 435,200	\$ 841,568
3. SUBSTATION STRUCTURES	\$ 199,800	\$ 199,800	\$ 399,600
4. MAJOR EQUIPMENT	\$ 600,000	\$ 240,000	\$ 840,000
5. SMALL EQUIPMENT / MATERIALS	\$ 353,000	\$ 192,500	\$ 545,500
6. CONTROL HOUSE / PANELS	\$ 726,650	\$ 500,400	\$ 1,227,050
7. MISC ITEMS	\$ 525,680	\$ 788,055	\$ 1,313,735
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 225,244	\$ 1,035,409	\$ 1,260,653
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 3,040,792	\$ 3,402,614	\$ 6,443,406
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 3,040,792	\$ 3,402,614	\$ 6,443,406

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. New Scotland Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	150	CY	\$ 27	\$ 4,050	\$ 75	\$ 11,250	\$ 102	\$ 15,300
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide (From Gordon RD)	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 4,050		\$ 11,250		\$ 15,300
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	24	EA	\$ 4,482	\$ 107,568	\$ 4,800	\$ 115,200	\$ 9,282	\$ 222,768
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	15	EA	\$ 4,482	\$ 67,230	\$ 4,800	\$ 72,000	\$ 9,282	\$ 139,230
2.1j	Instrument Transformer Stand Foundations	12	EA	\$ 4,482	\$ 53,784	\$ 4,800	\$ 57,600	\$ 9,282	\$ 111,384
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 406,368		\$ 435,200		\$ 841,568
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	4	EA	\$ 14,800	\$ 59,200	\$ 14,800	\$ 59,200	\$ 29,600	\$ 118,400
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	15	EA	\$ 3,700	\$ 55,500	\$ 3,700	\$ 55,500	\$ 7,400	\$ 111,000
3.1g	Instrument Transformer Stand	12	EA	\$ 1,850	\$ 22,200	\$ 1,850	\$ 22,200	\$ 3,700	\$ 44,400
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Lightning Masts - 70'	2	EA	\$ 6,475	\$ 12,950	\$ 6,475	\$ 12,950	\$ 12,950	\$ 25,900
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 199,800		\$ 199,800		\$ 399,600
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 600,000		\$ 240,000		\$ 840,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ 35,000	\$ 105,000	\$ 17,500	\$ 52,500	\$ 157,500	\$ 157,500
5.1c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 12,000	\$ 36,000	\$ 25,000	\$ 75,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 353,000		\$ 192,500		\$ 545,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 243,750	\$ 243,750	\$ 42,500	\$ 42,500	\$ 286,250	\$ 286,250
6.2	Protection and Telecom Equipment Panels	5	EA	\$ 35,000	\$ 175,000	\$ 10,000	\$ 50,000	\$ 45,000	\$ 225,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 207,900	\$ 207,900	\$ 207,900	\$ 207,900	\$ 415,800	\$ 415,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.7	DC Distribution System	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 726,650		\$ 500,400		\$ 1,227,050
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1	L.S.	\$ 55,500.00	\$ 55,500	\$ 76,500.00	\$ 76,500	\$ 132,000	\$ 132,000
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ 62,535.00	\$ 62,535	\$ 118,550.00	\$ 118,550	\$ 181,085	\$ 181,085
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ 92,250.00	\$ 92,250	\$ 114,135.00	\$ 114,135	\$ 206,385	\$ 206,385
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 48,870.00	\$ 48,870	\$ 59,265	\$ 59,265
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.9	SSVT Service	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12	Install new communication tower foundation.	1	LS		\$ -	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000
7.13	Relocate exiting communication tower.	1	LS		\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 525,680		\$ 788,055		\$ 1,313,735
<b>H. New Scotland Substation - Install</b>					\$ 2,815,548		\$ 2,367,205		\$ 5,182,753
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 51,828	\$ 51,828	\$ 51,828	\$ 51,828
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 264,727	\$ 264,727	\$ 264,727	\$ 264,727
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 51,828	\$ 51,828	\$ 51,828	\$ 51,828
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 51,828	\$ 51,828	\$ 51,828	\$ 51,828
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 414,620	\$ 414,620	\$ 414,620	\$ 414,620
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 36,279	\$ 36,279	\$ 36,279	\$ 36,279
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 129,569	\$ 129,569	\$ 129,569	\$ 129,569

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 15,548	\$ 15,548	\$ 15,548	\$ 15,548
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 225,244	\$ 225,244	\$ -	\$ -	\$ 225,244	\$ 225,244
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 5,183	\$ 5,183	\$ 5,183	\$ 5,183
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 225,244		\$ 1,035,409		\$ 1,260,653

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**I. New Scotland Substation - Removal**

Estimate Revision: **7**

Total: \$ **94,640**

<i>NAT &amp; NYPA - T028 - (Segment A, Enhanced)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>I. New Scotland Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 28,800	\$ 28,800
3. SUBSTATION STRUCTURES	\$ -	\$ 27,000	\$ 27,000
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 21,000	\$ 21,000
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 13,340	\$ 13,340
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 94,640	\$ 94,640
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 94,640	\$ 94,640

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. New Scotland Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	12	EA	\$ -	\$ -	\$ 2,400	\$ 28,800	\$ 2,400	\$ 28,800
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 28,800		\$ 28,800
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	12	EA	\$ -	\$ -	\$ 2,250	\$ 27,000	\$ 2,250	\$ 27,000
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 27,000		\$ 27,000
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 21,000.00	\$ 21,000	\$ 21,000	\$ 21,000
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 21,000		\$ 21,000
<b>I. New Scotland Substation - Removal</b>					\$ -		\$ 81,300		\$ 81,300
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 813	\$ 813	\$ 813	\$ 813
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS		\$ -	\$ 4,153	\$ 4,153	\$ 4,153	\$ 4,153
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 813	\$ 813	\$ 813	\$ 813
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 813	\$ 813	\$ 813	\$ 813
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 6,504	\$ 6,504	\$ 6,504	\$ 6,504
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 569	\$ -	\$ 569	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 2,033	\$ -	\$ 2,033	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 244	\$ 244	\$ 244	\$ 244
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 81	\$ -	\$ 81	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 13,340		\$ 13,340

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**J. Porter Substation - Install**

Estimate Revision: 7

Total: \$ 86,710

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ 15,008	\$ 56,904	\$ 71,912
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,201	\$ 13,597	\$ 14,798
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 16,209	\$ 70,501	\$ 86,710
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 16,209	\$ 70,501	\$ 86,710

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Porter Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ -		\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 40,000	\$ -	\$ 17,500	\$ -	\$ 57,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 30,000	\$ -	\$ 15,000	\$ -	\$ 45,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 28,000	\$ -	\$ 15,000	\$ -	\$ 43,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 33,000	\$ -	\$ 17,500	\$ -	\$ 50,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ 35,000	\$ -	\$ 10,000	\$ -	\$ 45,000	\$ -
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	0	LS	\$ 35,000	\$ -	\$ 12,500	\$ -	\$ 47,500	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ 15,008.40	\$ 15,008	\$ 56,904.00	\$ 56,904	\$ 71,912	\$ 71,912
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.11	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>J. Porter Substation - Install</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS	\$ -	\$ -	\$ 3,673	\$ 3,673	\$ 3,673	\$ 3,673
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,753	\$ 5,753	\$ 5,753	\$ 5,753
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 503	\$ -	\$ 503	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,798	\$ 1,798	\$ 1,798	\$ 1,798

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 216	\$ 216	\$ 216	\$ 216
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,201	\$ 1,201	\$ -	\$ -	\$ 1,201	\$ 1,201
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 72	\$ -	\$ 72	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,201		\$ 13,597		\$ 14,798

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**K. Porter Substation - Removal**

Estimate Revision: 7

Total: \$ 552,137

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>K. Porter Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 126,600	\$ 126,600
3. SUBSTATION STRUCTURES	\$ -	\$ 206,100	\$ 206,100
4. MAJOR EQUIPMENT	\$ -	\$ 43,500	\$ 43,500
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 59,500	\$ 59,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 38,613	\$ 38,613
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 77,824	\$ 77,824
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 552,137	\$ 552,137
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 552,137	\$ 552,137

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Porter Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	3	EA	\$ -	\$ -	\$ 7,200	\$ 21,600	\$ 7,200	\$ 21,600
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	5	EA	\$ -	\$ -	\$ 5,200	\$ 26,000	\$ 5,200	\$ 26,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	4	EA	\$ -	\$ -	\$ 2,400	\$ 9,600	\$ 2,400	\$ 9,600
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 126,600		\$ 126,600
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	6	EA	\$ -	\$ -	\$ 9,750	\$ 58,500	\$ 9,750	\$ 58,500
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 206,100		\$ 206,100
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	3	EA	\$ -	\$ -	\$ 14,500	\$ 43,500	\$ 14,500	\$ 43,500
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 43,500		\$ 43,500
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	2	EA	\$ -	\$ -	\$ 5,500	\$ 11,000	\$ 5,500	\$ 11,000
5.2b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2c	VT'S	2	EA	\$ -	\$ -	\$ 1,500	\$ 3,000	\$ 1,500	\$ 3,000
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	6	EA	\$ -	\$ -	\$ 1,500	\$ 9,000	\$ 1,500	\$ 9,000
5.2f	Arresters	6	EA	\$ -	\$ -	\$ 2,500	\$ 15,000	\$ 2,500	\$ 15,000
5.2g	Wave Traps	2	EA	\$ -	\$ -	\$ 2,500	\$ 5,000	\$ 2,500	\$ 5,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 59,500		\$ 59,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cable	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ -	\$ -	\$ 18,937.50	\$ 18,938	\$ 18,938	\$ 18,938
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ -	\$ -	\$ 19,675.00	\$ 19,675	\$ 19,675	\$ 19,675
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 38,613		\$ 38,613
<b>K. Porter Substation - Removal</b>					\$ -		\$ 474,313		\$ 474,313
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS		\$ -	\$ 24,227	\$ 24,227	\$ 24,227	\$ 24,227
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 37,945	\$ 37,945	\$ 37,945	\$ 37,945
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 3,320	\$ -	\$ 3,320	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 11,858	\$ -	\$ 11,858	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,423	\$ 1,423	\$ 1,423	\$ 1,423
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 474	\$ -	\$ 474	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 77,824		\$ 77,824

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**L. Interconnection Edic Station**

Estimate Revision: **7** Total: \$ **2,127,440**

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>L. Interconnection Edic Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 168,366	\$ 170,169	\$ 338,536
3. STRUCTURES	\$ 501,469	\$ 321,821	\$ 823,289
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 160,000	\$ 94,400	\$ 254,400
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 66,387	\$ 276,979	\$ 343,365
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,231,219</b>	\$ <b>2,127,440</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,231,219</b>	\$ <b>2,127,440</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Edic Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ -	\$ 367,850	\$ -	\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8'X 27'	3	EA	\$ 41,332	\$ 123,995	\$ 41,774	\$ 125,322	\$ 83,106	\$ 249,317
2.2	Foundation – Drilled Pier – 8'X 29'	1	EA	\$ 44,372	\$ 44,372	\$ 44,847	\$ 44,847	\$ 89,219	\$ 89,219
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.15					\$ 168,366		\$ 170,169		\$ 338,536
<b>TOTAL - FOUNDATIONS</b>									
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) – 105'	3	Structure	\$ 98,883	\$ 296,648	\$ 59,330	\$ 177,989	\$ 158,212	\$ 474,636
3.2	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.3	Install Grounding and Grounding Accessories	4	Pole	\$ 506	\$ 2,024	\$ 5,539	\$ 22,154	\$ 6,045	\$ 24,178
3.4					\$ -		\$ -		\$ -
3.5									
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>									
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>									
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)								
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)								
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)								
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.10	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.11	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15									
5.16									
5.17									
5.18									
5.19	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>									
<b>L. Interconnection Edic Station</b>									
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 91,128	\$ 91,128	\$ 91,128	\$ 91,128

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 89,204	\$ 89,204	\$ 89,204	\$ 89,204
6.6	LIDAR	-	LS	\$ -	\$ -	\$ 5,352	\$ -	\$ 5,352	\$ -
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,489	\$ 12,489	\$ 12,489	\$ 12,489
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,352	\$ 5,352	\$ 5,352	\$ 5,352
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 66,387	\$ 66,387	\$ -	\$ -	\$ 66,387	\$ 66,387
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 1,784	\$ 1,784	\$ 1,784	\$ 1,784
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 66,387		\$ 276,979		\$ 343,365

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**M. Interconnection New Scotland Station**

Estimate  
Revision: 7

Total: \$ 3,109,008

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>M. Interconnection New Scotland Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 365,657	\$ 473,093	\$ 838,749
3. STRUCTURES	\$ 655,465	\$ 445,628	\$ 1,101,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,555	\$ 26,100	\$ 29,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 161,130	\$ 95,795	\$ 256,925
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 94,864	\$ 419,873	\$ 514,737
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,828,338</b>	<b>\$ 3,109,008</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,280,670</b>	<b>\$ 1,828,338</b>	<b>\$ 3,109,008</b>

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection New Scotland Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ 367,850	\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 50’	3	EA	\$ 76,500	\$ 229,501	\$ 77,320	\$ 231,959	\$ 153,820	\$ 461,459
2.2	Foundation – Drilled Pier – 8’X 89’	1	EA	\$ 136,156	\$ 136,156	\$ 137,614	\$ 137,614	\$ 273,770	\$ 273,770
2.3	Rock Excavation Adder	51.8	CY	\$ -	\$ -	\$ 2,000	\$ 103,520	\$ 2,000	\$ 103,520
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 365,657		\$ 473,093		\$ 838,749
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	3	Structure	\$ 178,026	\$ 534,077	\$ 106,815	\$ 320,446	\$ 284,841	\$ 854,522
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	Install Grounding and Grounding Accessories	10	Structure	\$ 506	\$ 5,060	\$ 5,539	\$ 55,385	\$ 6,045	\$ 60,445
3.4					\$ -		\$ -		
3.5					\$ -		\$ -		
3.6					\$ -		\$ -		
3.7					\$ -		\$ -		
3.8					\$ -		\$ -		
3.9					\$ -		\$ -		
3.10					\$ -		\$ -		
3.11					\$ -		\$ -		
3.12					\$ -		\$ -		
3.13					\$ -		\$ -		
3.14					\$ -		\$ -		
3.15					\$ -		\$ -		
<b>TOTAL - STRUCTURES</b>					\$ 655,465		\$ 445,628		\$ 1,101,092
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (2) 954kcmil 54/7 ACSS "Cardinal"	1,500	LF	\$ 1.90	\$ 2,850	\$ 5.00	\$ 7,500	\$ 6.90	\$ 10,350
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	1,500	LF	\$ 0.47	\$ 705	\$ 5.00	\$ 7,500	\$ 5.47	\$ 8,205
4.5	Remove Existing 345KV Cable From Existing Structures	0.3	Mile	\$ -	\$ -	\$ 30,000	\$ 7,500	\$ 30,000.00	\$ 7,500
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	0.3	Mile	\$ -	\$ -	\$ 12,000	\$ 3,600	\$ 12,000.00	\$ 3,600
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,555		\$ 26,100		\$ 29,655
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.10	Spacer - Conductor	9	EA	\$ 50	\$ 450	\$ 35	\$ 315	\$ 85	\$ 765
5.11	Vibration Dampers - Conductor	48	EA	\$ 35	\$ 1,680	\$ 35	\$ 1,680	\$ 70	\$ 3,360
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15					\$ -		\$ -		\$ -
5.16	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19					\$ -		\$ -		\$ -
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 161,130		\$ 95,795		\$ 256,925
<b>M. Interconnection New Scotland Station</b>					\$ 1,185,806		\$ 1,408,465		\$ 2,594,271
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 132,511	\$ 132,511	\$ 132,511	\$ 132,511
6.3	Utility PM and Project Oversite	1	LS		\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 25,943	\$ 25,943	\$ 25,943	\$ 25,943
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 129,714	\$ 129,714	\$ 129,714	\$ 129,714
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 18,160	\$ 18,160	\$ 18,160	\$ 18,160
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 7,783	\$ 7,783	\$ 7,783	\$ 7,783
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 94,864	\$ 94,864	\$ -	\$ -	\$ 94,864	\$ 94,864
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,594	\$ 2,594	\$ 2,594	\$ 2,594
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 94,864		\$ 419,873		\$ 514,737

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**System Upgrade Facilities (Various Stations for Edic/Marcy to New Scotland)**

Estimate Revision: **7**

**Total: \$ 6,899,000**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
SUF SS1	Marcy 345kV Bay 3300 - Reconductor Strain Bus UNS-18 Marcy-New Scotland Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 664,560	\$ 665,000
SUF SS1	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 30,000
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 174,000
<b>SUF SS1</b>	<b>SUF SS1 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 869,000</b>
SUF SS2	Marcy 345kV Bay 3100 - Reconductor Strain Bus, Replace (3) breakers and wave trap UE1-7- Marcy-Edic Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 2,946,086	\$ 2,947,000
SUF SS2	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 120,720	\$ 121,000
SUF SS2	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 767,000
<b>SUF SS2</b>	<b>SUFSS 2 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 3,835,000</b>
SUF SS3	Edic 345kV Bay - UE1-7- Marcy-Edic Line Replace (2) breakers and wave tran	1	LS					\$ 1,661,294	\$ 1,662,000
SUF SS3	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 93,120	\$ 94,000
SUF SS3	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 439,000
<b>SUF SS3</b>	<b>SUF SS3 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 2,195,000</b>
SUF SS4		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS4	Removals		LS %					\$ -	\$ -
SUF SS4	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS4</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
SUF SS5		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS5	Removals		LS %					\$ -	\$ -
SUF SS5	Engineering, T&C, PM, Indirects (25%)		LS %						\$ -
<b>SUF SS5</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>STATIONS SUF DIRECT TOTAL:</b>									<b>\$ 5,519,000</b>
<b>STATIONS SUF INDIRECT TOTAL:</b>									<b>\$ 1,380,000</b>
<b>STATIONS SUF TOTAL</b>									<b>\$ 6,899,000</b>

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**N. Interconnection Rotterdam Station**

Estimate Revision: **7** Total: \$ **4,612,611**

<i>NAT &amp; NYPA - T028 - (Segment A, Enhanced)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>N. Interconnection Rotterdam Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,233,050	\$ 1,233,050
2. FOUNDATIONS	\$ 192,145	\$ 325,963	\$ 518,108
3. STRUCTURES	\$ 546,722	\$ 837,150	\$ 1,383,872
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 65,923	\$ 437,250	\$ 503,173
5. INSULATORS, FITTINGS, HARDWARE	\$ 165,730	\$ 118,480	\$ 284,210
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 77,642	\$ 612,557	\$ 690,199
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>1,048,161</b>	\$ <b>3,564,450</b>	\$ <b>4,612,611</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>1,048,161</b>	\$ <b>3,564,450</b>	\$ <b>4,612,611</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Rotterdam Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	7.0	Acre	\$ -	\$ -	\$ 15,000	\$ 105,000	\$ 15,000	\$ 105,000
1.2	Clearing the ROW - Light (mowing)	5.0	Acre	\$ -	\$ -	\$ 5,000	\$ 25,000	\$ 5,000	\$ 25,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	4,800.0	LF	\$ -	\$ -	\$ 4	\$ 19,200	\$ 4	\$ 19,200
1.5	Matting - Access and ROW	4,800.0	LF	\$ -	\$ -	\$ 70	\$ 336,000	\$ 70	\$ 336,000
1.6	Matting - To Work Area	2,400.0	LF	\$ -	\$ -	\$ 70	\$ 168,000	\$ 70	\$ 168,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	1.0	Mile	\$ -	\$ -	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
1.9	Work Pads	160,000.0	SF	\$ -	\$ -	\$ 4	\$ 563,200	\$ 4	\$ 563,200
1.10	Restoration for Work Pad areas	32,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 4,800	\$ 0	\$ 4,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ -	\$ 1,233,050		\$ 1,233,050
<b>2. FOUNDATIONS</b>									
2.1	10' ED Rock BF	6	EA	\$ 358	\$ 2,145	\$ 3,575	\$ 21,450	\$ 3,933	\$ 23,595
2.2	15' ED Rock BF	18	EA	\$ 536	\$ 9,653	\$ 5,363	\$ 96,525	\$ 5,899	\$ 106,178
2.3	20' ED Rock BF	4	EA	\$ 715	\$ 2,860	\$ 7,150	\$ 28,600	\$ 7,865	\$ 31,460
2.4	Foundation – Drilled Pier – 8'X 29'	4	EA	\$ 44,372	\$ 177,487	\$ 44,847	\$ 179,388	\$ 89,219	\$ 356,875
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.11				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.12				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.13				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 192,145		\$ 325,963		\$ 518,108
<b>3. STRUCTURES</b>									
3.1	15kv 3-CKT TANGENT DIST. - WOOD POLE	3	Pole	\$ 3,500	\$ 10,500	\$ 3,600	\$ 10,800	\$ 7,100	\$ 21,300
3.2	15kv 3-CKT MA DIST. - WOOD POLE	1	Pole	\$ 3,500	\$ 3,500	\$ 3,600	\$ 3,600	\$ 7,100	\$ 7,100
3.3	15kv 3-CKT DE - WOOD POLE	2	Pole	\$ 3,500	\$ 7,000	\$ 3,600	\$ 7,200	\$ 7,100	\$ 14,200
3.4	115kv 1-CKT TANGENT - WOOD POLE	5	Pole	\$ 4,500	\$ 22,500	\$ 4,400	\$ 22,000	\$ 8,900	\$ 44,500
3.5	115kv 1-CKT MA - WOOD POLE	2	Pole	\$ 4,500	\$ 9,000	\$ 4,400	\$ 8,800	\$ 8,900	\$ 17,800
3.6	115kv 1-CKT DE - WOOD POLE	11	Pole	\$ 5,500	\$ 60,500	\$ 5,000	\$ 55,000	\$ 10,500	\$ 115,500
3.7	115kv 2-CKT TANGENT - WOOD POLE	4	Pole	\$ 5,500	\$ 22,000	\$ 5,000	\$ 20,000	\$ 10,500	\$ 42,000
3.8	115kv 2-CKT DE - STEEL POLE	4	Pole	\$ 98,883	\$ 395,530	\$ 59,330	\$ 237,318	\$ 158,212	\$ 632,848
3.9	Remove Existing Structure and Accessories	24	EA		\$ -	\$ 12,300	\$ 295,200	\$ 12,300	\$ 295,200
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12	Install Grounding and Grounding Accessories	32	Structure	\$ 506	\$ 16,192	\$ 5,539	\$ 177,232	\$ 6,045	\$ 193,424
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 546,722		\$ 837,150		\$ 1,383,872
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	23,400	LF	\$ 1.90	\$ 44,460	\$ 5.00	\$ 117,000	\$ 6.90	\$ 161,460
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	7,800	LF	\$ 0.47	\$ 3,666	\$ 5.00	\$ 39,000	\$ 5.47	\$ 42,666
4.5	Remove Existing Cable	6.6	Mile	\$ -	\$ -	\$ 30,000	\$ 197,700	\$ 30,000.00	\$ 197,700
4.6	Remove Existing EH7	2.2	Mile	\$ -	\$ -	\$ 12,000	\$ 26,400	\$ 12,000.00	\$ 26,400
4.7	15kv - (1) 477kcmil 26/7 ACSR "Hawk"	9,630	LF	\$ 1.62	\$ 15,601	\$ 5.00	\$ 48,150	\$ 6.62	\$ 63,751
4.8	15kv - (1) 336kcmil 26/7 ACSR "Linnet"	1,800	LF	\$ 1.22	\$ 2,196	\$ 5.00	\$ 9,000	\$ 6.22	\$ 11,196
4.9		-			\$ -		\$ -		\$ -
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 65,923		\$ 437,250		\$ 503,173
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	115kv Tangent (1-Group of 9-Bells Each Assembly)	33	Assembly	\$ 1,000	\$ 33,000	\$ 560	\$ 18,480	\$ 1,560	\$ 51,480
5.2	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	66	Assembly	\$ 1,000	\$ 66,000	\$ 560	\$ 36,960	\$ 1,560	\$ 102,960
5.3	15kv Tangent	12	Assembly	\$ 100	\$ 1,200	\$ 75	\$ 900	\$ 175	\$ 2,100
5.4	15kv Dead-end & Angle Insulators	18	Assembly	\$ 100	\$ 1,800	\$ 75	\$ 1,350	\$ 175	\$ 3,150
5.5	Neutral, Distribution, Tangent	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.6	Neutral, Distribution, DE/Side	2	Assembly	\$ 100	\$ 200	\$ 75	\$ 150	\$ 175	\$ 350
5.7	Jumper, DE/Angle, 3PH	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.8	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OSHW Assembly - Tangent	11	Assembly	\$ 250	\$ 2,750	\$ 150	\$ 1,650	\$ 400	\$ 4,400
5.10	OSHW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.11	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.12	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.13	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.14	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.16	Guys, Anchors, and Accessories	14.0	EA	\$ 720	\$ 10,080	\$ 885	\$ 12,390	\$ 1,605	\$ 22,470
5.17	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	8	EA	\$ 5,000	\$ 40,000	\$ 5,000	\$ 40,000	\$ 10,000	\$ 80,000
5.20					\$ -		\$ -		\$ -
5.21					\$ -		\$ -		\$ -
5.22					\$ -		\$ -		\$ -
5.23					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 165,730		\$ 118,480		\$ 284,210
<b>N. Interconnection Rotterdam Station</b>					\$ 970,519		\$ 2,951,893		\$ 3,922,412
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 200,351	\$ 200,351	\$ 200,351	\$ 200,351
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 196,121	\$ 196,121	\$ 196,121	\$ 196,121
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 27,457	\$ 27,457	\$ 27,457	\$ 27,457
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 77,642	\$ 77,642	\$ -	\$ -	\$ 77,642	\$ 77,642
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 3,922	\$ 3,922	\$ 3,922	\$ 3,922
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 77,642		\$ 612,557		\$ 690,199

**NAT & NYPA - T028 - (Segment A, Enhanced)**

**Q. Princetown Switchyard - Install**

Estimate Revision: **7**

Total: \$ **15,967,903**

NAT & NYPA - T028 - (Segment A, Enhanced)			
	Supply	Installation	Total
<b>Q. Princetown Switchyard - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 163,560	\$ 909,775	\$ 1,073,335
2. SUBSTATION FOUNDATIONS	\$ 1,193,706	\$ 1,213,490	\$ 2,407,196
3. SUBSTATION STRUCTURES	\$ 582,750	\$ 582,750	\$ 1,165,500
4. MAJOR EQUIPMENT	\$ 800,000	\$ 320,000	\$ 1,120,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,382,000	\$ 636,000	\$ 2,018,000
6. CONTROL HOUSE / PANELS	\$ 1,621,800	\$ 1,043,550	\$ 2,665,350
7. MISC ITEMS	\$ 895,854	\$ 1,373,004	\$ 2,268,858
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 531,174	\$ 2,718,490	\$ 3,249,664
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 7,170,844</b>	<b>\$ 8,797,059</b>	<b>\$ 15,967,903</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 7,170,844</b>	<b>\$ 8,797,059</b>	<b>\$ 15,967,903</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Q. Princetown Switchyard - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.1	ACRES	\$ -	\$ -	\$ 203,000	\$ 634,375	\$ 203,000	\$ 634,375
1.2	Station stone within substation fence.	1,080	CY	\$ 27	\$ 29,160	\$ 75	\$ 81,000	\$ 102	\$ 110,160
1.3	Substation Fence	1,260	LF	\$ 100	\$ 126,000	\$ 100	\$ 126,000	\$ 200	\$ 252,000
1.4	Permanent Access Road - 20'-Wide (Extend Existing)	240	LF	\$ 35	\$ 8,400	\$ 285	\$ 68,400	\$ 320	\$ 76,800
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 163,560		\$ 909,775		\$ 1,073,335
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 765kV</b>									
2.1a	Circuit Breaker Foundations		EA.	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.1b	Capacitor Bank Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)		EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1e	Switch Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1f	Fuse Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1g	Bus Support 1ph Foundations (High Bus)		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations (Low Bus)		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1j	Instrument Transformer Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1k	Arrester Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1m	Wave Trap Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 345kV</b>									
2.2a	Circuit Breaker Foundations	4	EA.	\$ 14,940	\$ 59,760	\$ 14,940	\$ 59,760	\$ 29,880	\$ 119,520
2.2b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	16	EA.	\$ 26,145	\$ 418,320	\$ 26,145	\$ 418,320	\$ 52,290	\$ 836,640
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA.	\$ 26,145	\$ -	\$ 26,145	\$ -	\$ 52,290	\$ -
2.2e	Switch Stand Foundations	48	EA.	\$ 4,482	\$ 215,136	\$ 4,482	\$ 215,136	\$ 8,964	\$ 430,272
2.2f	Fuse Stand Foundations	6	EA.	\$ 4,482	\$ 26,892	\$ 4,482	\$ 26,892	\$ 8,964	\$ 53,784

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 1ph Foundations (High Bus)	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations (Low Bus)	39	EA.	\$ 4,482	\$ 174,798	\$ 4,482	\$ 174,798	\$ 8,964	\$ 349,596
2.2j	Instrument Transformer Stand Foundations	36	EA.	\$ 4,482	\$ 161,352	\$ 4,482	\$ 161,352	\$ 8,964	\$ 322,704
2.2k	Arrester Stand Foundations	12	EA.	\$ 4,482	\$ 53,784	\$ 4,482	\$ 53,784	\$ 8,964	\$ 107,568
2.2m	Wave Trap Stand Foundations	4	EA.	\$ 4,482	\$ 17,928	\$ 4,482	\$ 17,928	\$ 8,964	\$ 35,856
2.2n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	765-345kV Transformer Foundation w/ Oil Containment		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	765-345kV Transformer Fire Wall		EA.	\$ 106,074	\$ -	\$ 113,600	\$ -	\$ 219,674	\$ -
2.4c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad / Generator / Station Service Distribution Line</b>								
2.5a	Control House / Pad - 25' x 50'	1	EA	\$ 17,928	\$ 17,928	\$ 19,200	\$ 19,200	\$ 37,128	\$ 37,128
2.5b	Generator Foundation	1	EA	\$ 16,434	\$ 16,434	\$ 17,600	\$ 17,600	\$ 34,034	\$ 34,034
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 15,120	\$ 15,120	\$ 15,120	\$ 15,120
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	6	EA	\$ 5,229	\$ 31,374	\$ 5,600	\$ 33,600	\$ 10,829	\$ 64,974
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,193,706		\$ 1,213,490		\$ 2,407,196
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>765kV</b>								
3.1a	Substation A-Frame Structures - Stand alone		EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column		EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1c	Switch Stands		EA.	\$ 22,200	\$ -	\$ 22,200	\$ -	\$ 44,400	\$ -
3.1d	Station Service Transformer Stand		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 1ph (High Bus)		EA.	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1f	Bus Support 1 Ph (low Bus)		EA.	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.1g	Instrument Transformer Stand		EA.	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1h	Arrester Stand		EA.	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1j	Wave Trap Stand		EA.	\$ 9,250	\$ -	\$ 9,250	\$ -	\$ 18,500	\$ -
3.1k	Lightning Mast		EA.	\$ 9,250	\$ -	\$ 9,250	\$ -	\$ 18,500	\$ -
<b>3.2</b>	<b>345kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	4	EA	\$ 37,000	\$ 148,000	\$ 37,000	\$ 148,000	\$ 74,000	\$ 296,000
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.2c	Switch Stands	8	EA	\$ 14,800	\$ 118,400	\$ 14,800	\$ 118,400	\$ 29,600	\$ 236,800
3.2d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.2e	Bus Support 3ph	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2f	Bus Support 1 Ph	39	EA	\$ 3,700	\$ 144,300	\$ 3,700	\$ 144,300	\$ 7,400	\$ 288,600
3.2g	Instrument Transformer Stand	36	EA	\$ 1,850	\$ 66,600	\$ 1,850	\$ 66,600	\$ 3,700	\$ 133,200
3.2h	Arrester Stand	12	EA	\$ 1,850	\$ 22,200	\$ 1,850	\$ 22,200	\$ 3,700	\$ 44,400
3.2j	Wave Trap Stand	4	EA	\$ 7,400	\$ 29,600	\$ 7,400	\$ 29,600	\$ 14,800	\$ 59,200
3.2k	Misc. Structures	6	EA	\$ 6,475	\$ 38,850	\$ 6,475	\$ 38,850	\$ 12,950	\$ 77,700

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 582,750		\$ 582,750		\$ 1,165,500
<b>4. MAJOR EQUIPMENT</b>									
<b>4.2</b>	<b>345kV</b>								
4.2a	Circuit Breakers	4	EA	\$ 200,000	\$ 800,000	\$ 80,000	\$ 320,000	\$ 280,000	\$ 1,120,000
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 800,000		\$ 320,000		\$ 1,120,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.2</b>	<b>345kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	4	EA	\$ 40,000	\$ 160,000	\$ 15,000	\$ 60,000	\$ 55,000	\$ 220,000
5.2b	Disconnect Switches - 3ph w/ manual operator	8	EA	\$ 35,000	\$ 280,000	\$ 17,500	\$ 140,000	\$ 52,500	\$ 420,000
5.2c	VT'S	12	EA	\$ 25,000	\$ 300,000	\$ 12,000	\$ 144,000	\$ 37,000	\$ 444,000
5.2d	CT'S	12	EA	\$ 13,000	\$ 156,000	\$ 8,000	\$ 96,000	\$ 21,000	\$ 252,000
5.2e	CCVT'S	12	EA	\$ 13,000	\$ 156,000	\$ 8,000	\$ 96,000	\$ 21,000	\$ 252,000
5.2f	Arresters	12	EA	\$ 6,500	\$ 78,000	\$ 1,500	\$ 18,000	\$ 8,000	\$ 96,000
5.2g	Wave Traps	4	EA	\$ 13,000	\$ 52,000	\$ 8,000	\$ 32,000	\$ 21,000	\$ 84,000
5.2h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,382,000		\$ 636,000		\$ 2,018,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 245,750	\$ 245,750	\$ 37,500	\$ 37,500	\$ 283,250	\$ 283,250
6.2	Protection and Telecom Equipment Panels	18	EA	\$ 35,000	\$ 630,000	\$ 10,000	\$ 180,000	\$ 45,000	\$ 810,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 281,050	\$ 281,050	\$ 281,050	\$ 281,050	\$ 562,100	\$ 562,100
6.5	SCADA and Communications	0	EA	\$ 35,000	\$ -	\$ 12,500	\$ -	\$ 47,500	\$ -
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,621,800		\$ 1,043,550		\$ 2,665,350
<b>7. MISC ITEMS 345kV</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.15	Conduit & Cable Trench System	1,200	LF	\$ 125.07	\$ 150,084	\$ 170.00	\$ 204,000	\$ 295	\$ 354,084
7.16	Rigid Bus, Fittings & Insulators	1,000	LF	\$ 125.07	\$ 125,070	\$ 237.10	\$ 237,100	\$ 362	\$ 362,170
7.17	Strain Bus, Connectors & Insulators	1,600	LF	\$ 61.50	\$ 98,400	\$ 78.69	\$ 125,904	\$ 140	\$ 224,304
7.18	Grounding System	10,000	LF	\$ 6.93	\$ 69,300	\$ 32.58	\$ 325,800	\$ 40	\$ 395,100
7.19	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.20	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.21	SSVT Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.22	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.23	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.24									
7.25									
7.26									
7.27									
7.28									
7.29									
<b>TOTAL - MISC ITEMS</b>					\$ 895,854		\$ 1,373,004		\$ 2,268,858
<b>Q. Princetown Switchyard - Install</b>					\$ 6,639,670		\$ 6,078,569		\$ 12,718,239
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 127,182	\$ 127,182	\$ 127,182	\$ 127,182
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 649,627	\$ 649,627	\$ 649,627	\$ 649,627
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 127,182	\$ 127,182	\$ 127,182	\$ 127,182
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 127,182	\$ 127,182	\$ 127,182	\$ 127,182
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,017,459	\$ 1,017,459	\$ 1,017,459	\$ 1,017,459
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 89,028	\$ 89,028	\$ 89,028	\$ 89,028
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 317,956	\$ 317,956	\$ 317,956	\$ 317,956
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 38,155	\$ 38,155	\$ 38,155	\$ 38,155
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 198,000	\$ 198,000	\$ 198,000	\$ 198,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 531,174	\$ 531,174	\$ -	\$ -	\$ 531,174	\$ 531,174
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 12,718	\$ 12,718	\$ 12,718	\$ 12,718
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 531,174		\$ 2,718,490		\$ 3,249,664

<b>NAT &amp; NYPA - T028 - (Segment A, Enhanced)</b>	
<b>ESTIMATE ASSUMPTIONS &amp; CLARIFICATIONS</b>	
1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 4.44% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.

<b>ITC (T031)</b>			
<b>Description</b>		<b>Total Amount (In thousand \$)</b>	
<b>Direct Cost</b>	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$53,084
	1.2	Foundations	\$43,503
	1.3	Structures	\$80,620
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$41,525
	1.5	Insulators, Fitting and Hardwares	\$18,615
	Subtotal (1)		<b>\$237,347</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Rotterdam Substation	\$19,805
	2.2	Edic Substation	\$2,185
	2.3	Princetown Substation	\$27,974
	2.4	New Scotland Substation	\$3,615
	2.5	Porter Substation	\$546
	2.6	Knickerbocker Substation	\$0
	2.7	Marcy Substation	\$0
2.8	Substation Interconnections	\$8,383	
Subtotal (2)		<b>\$62,507</b>	
Total (1+2)		\$299,855	
Contractors Mark-up (15% of Total 1+2)		\$44,978	
Total Direct Cost (A)		<b>\$344,833</b>	
<b>Indirect Cost</b>	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,999
	3.2	Project Management, Material Handling & Amenities	\$18,925
	3.3	Engineering	\$19,832
	3.4	Testing & Commissioning	\$1,560
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$20,688
	3.6	Compensation for use of NYPA Structures (1 Circuit)	\$8,919
	3.7	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,941
Total Indirect Cost (3)		<b>\$80,864</b>	
<b>Subtotal Project Cost (B=A+3) 2017 \$</b>		<b>\$425,697</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	NUF proposed as element of the Project	\$0
	4.2	NUF identified during Evaluation	\$0
<b>Subtotal NUF Cost (C)</b>		<b>\$0</b>	
<b>Total Project Cost (B+C) 2017 \$</b>		<b>\$425,697</b>	
<b>Total Project Cost 2018 \$</b>		<b>\$438,468</b>	

**ITC - T031 - (Segment A)**

Estimate Revision: 5

<i>ITC - T031 - (Segment A) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Edic to Princetown	\$ 147,955,377
Direct Labor, Material & Equipment Costs	B. Transmission Line Princetown to Rotterdam	\$ 26,168,326
Direct Labor, Material & Equipment Costs	C. Transmission Line Princetown to New Scotland	\$ 63,223,686
Direct Labor, Material & Equipment Costs	D. Rotterdam Substation - Install	\$ 19,804,932
Direct Labor, Material & Equipment Costs	E. Rotterdam Substation - Removal	\$ -
Direct Labor, Material & Equipment Costs	F. Edic Substation - Install	\$ 2,148,785
Direct Labor, Material & Equipment Costs	G. Edic Substation - Removal	\$ 35,950
Direct Labor, Material & Equipment Costs	H. New Scotland Substation - Install	\$ 3,614,529
Direct Labor, Material & Equipment Costs	I. New Scotland Substation - Removal	\$ -
Direct Labor, Material & Equipment Costs	J. Porter Substation - Install	\$ 71,912
Direct Labor, Material & Equipment Costs	K. Porter Substation - Removal	\$ 474,313
Direct Labor, Material & Equipment Costs	L. Interconnection Edic Station	\$ 1,784,075
Direct Labor, Material & Equipment Costs	M. Interconnection New Scotland Station	\$ 2,676,471
Direct Labor, Material & Equipment Costs	N. Interconnection Rotterdam Station	\$ 3,922,412
Direct Labor, Material & Equipment Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Direct Labor, Material & Equipment Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ -
Direct Labor, Material & Equipment Costs	Q. Princetown Switchyard - Install	\$ 27,974,019
<b>SUBTOTAL:</b>		<b>\$ 299,854,787</b>
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		<b>\$ 44,978,218</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>		<b>\$ -</b>
<b>TOTAL DIRECT:</b>		<b>\$ 344,833,005</b>

<i>ITC - T031 - (Segment A) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Edic to Princetown	\$ 39,405,617
Indirect Costs	B. Transmission Line Princetown to Rotterdam	\$ 5,266,851
Indirect Costs	C. Transmission Line Princetown to New Scotland	\$ 13,535,116
Indirect Costs	D. Rotterdam Substation - Install	\$ 4,760,643
Indirect Costs	E. Rotterdam Substation - Removal	\$ -
Indirect Costs	F. Edic Substation - Install	\$ 511,515
Indirect Costs	G. Edic Substation - Removal	\$ 5,612
Indirect Costs	H. New Scotland Substation - Install	\$ 852,011
Indirect Costs	I. New Scotland Substation - Removal	\$ -
Indirect Costs	J. Porter Substation - Install	\$ 14,225
Indirect Costs	K. Porter Substation - Removal	\$ 74,047
Indirect Costs	L. Interconnection Edic Station	\$ 329,155
Indirect Costs	M. Interconnection New Scotland Station	\$ 508,897
Indirect Costs	N. Interconnection Rotterdam Station	\$ 658,957
Indirect Costs	O. System Upgrade Facilities (Various Lines for Edic to New Scotland)	\$ -
Indirect Costs	P. System Upgrade Facilities (Various Stations for Edic to New Scotland)	\$ -
Indirect Costs	Q. Princetown Switchyard - Install	\$ 7,000,251
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lic. & Permit., and Envir. Mitigation)	\$ 7,940,904
<b>TOTAL INDIRECT:</b>		<b>\$ 80,863,802</b>
<b>TOTAL ESTIMATED COST</b>		<b>\$ 425,696,808</b>

**ITC - T031 - (Segment A)**

**A. Transmission Line Edic to Princetown**

Estimate Revision: **5** Total: \$ **187,360,994**

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>A. Transmission Line Edic to Princetown</b>			
1. CLEARING & ACCESS	\$ 75,250	\$ 37,260,504	\$ 37,335,754
2. FOUNDATIONS	\$ 6,908,556	\$ 17,295,145	\$ 24,203,701
3. STRUCTURES	\$ 19,810,382	\$ 29,562,906	\$ 49,373,288
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 4,975,475	\$ 21,134,180	\$ 26,109,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 7,521,769	\$ 3,411,210	\$ 10,932,979
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 3,143,315	\$ 36,262,303	\$ 39,405,617
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 42,434,746</b>	<b>\$ 144,926,248</b>	<b>\$ 187,360,994</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 42,434,746</b>	<b>\$ 144,926,248</b>	<b>\$ 187,360,994</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Edic to Princetown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	154.0	Acre	\$ -	\$ -	\$ 5,000	\$ 770,000	\$ 5,000	\$ 770,000
1.3	Access Road	70,963.2	LF	\$ -	\$ -	\$ 45	\$ 3,193,344	\$ 45	\$ 3,193,344
1.4	Silt Fence	354,816.0	LF	\$ -	\$ -	\$ 4	\$ 1,419,264	\$ 4	\$ 1,419,264
1.5	Matting - Access and ROW	283,852.8	LF	\$ -	\$ -	\$ 70	\$ 19,869,696	\$ 70	\$ 19,869,696
1.6	Matting - To Work Area	25,200.0	LF	\$ -	\$ -	\$ 70	\$ 1,764,000	\$ 70	\$ 1,764,000
1.7	Snow Removal	67.2	Mile	\$ -	\$ -	\$ 16,000	\$ 1,075,200	\$ 16,000	\$ 1,075,200
1.8	ROW Restoration	67.2	Mile	\$ -	\$ -	\$ 10,000	\$ 672,000	\$ 10,000	\$ 672,000
1.9	Work Pads	2,225,000.0	SF	\$ -	\$ -	\$ 4	\$ 7,832,000	\$ 4	\$ 7,832,000
1.10	Restoration for Work Pad areas	445,000.0	SF	\$ -	\$ -	\$ 0.15	\$ 66,750	\$ 0	\$ 66,750
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	100	EA	\$ -	\$ -	\$ 4,130	\$ 413,000	\$ 4,130	\$ 413,000
1.15	Culverts / Misc. Access	55	EA	\$ 750	\$ 41,250	\$ 1,250	\$ 68,750	\$ 2,000	\$ 110,000
1.16	Gates	17	EA	\$ 2,000	\$ 34,000	\$ 2,500	\$ 42,500	\$ 4,500	\$ 76,500
1.17	Concrete Washout Station	40	EA	\$ -	\$ -	\$ 1,850	\$ 74,000	\$ 1,850	\$ 74,000
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 75,250	\$ 37,260,504	\$ 37,335,754	\$	\$ 37,335,754
<b>2. FOUNDATIONS</b>									
2.1	<b>Direct Embed</b> - 345KV SC 2-Pole Steel H-Frame - V-String - Tangent	806	EA	\$ 1,635	\$ 1,317,709	\$ 11,117	\$ 8,960,423	\$ 12,752	\$ 10,278,132
2.2	<b>Drilled Pier</b> - 345KV SC Steel 3-Pole Deadend	90	EA	\$ 44,372	\$ 3,993,462	\$ 44,847	\$ 4,036,230	\$ 89,219	\$ 8,029,692
2.3	<b>Drilled Pier</b> - 345KV SC Steel 3-Pole Storm Deadend	36	EA	\$ 44,372	\$ 1,597,385	\$ 44,847	\$ 1,614,492	\$ 89,219	\$ 3,211,877
2.4									
2.5									
2.6									
2.7									
2.8	Rock Excavation Adder	1,342	CY	\$ -	\$ -	\$ 2,000	\$ 2,684,000	\$ 2,000	\$ 2,684,000
2.9									
2.10									
<b>TOTAL - FOUNDATIONS:</b>					\$ 6,908,556	\$ 17,295,145	\$ 24,203,701	\$	\$ 24,203,701
<b>3. STRUCTURES</b>									
3.1	<b>Direct Embed</b> - 345KV SC 2-Pole Steel H-Frame - V-String - Tangent	403	Structure	\$ 42,550	\$ 17,147,650	\$ 25,530	\$ 10,288,590	\$ 68,080	\$ 27,436,240
3.2	<b>Drilled Pier</b> - 345KV SC Steel 3-Pole Deadend	30	Structure	\$ 52,170	\$ 1,565,100	\$ 31,302	\$ 939,060	\$ 83,472	\$ 2,504,160
3.3	<b>Drilled Pier</b> - 345KV SC Steel 3-Pole Storm Deadend	12	Structure	\$ 52,170	\$ 626,040	\$ 31,302	\$ 375,624	\$ 83,472	\$ 1,001,664
3.4									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
3.5									
3.6									
3.7									
3.8	Remove Existing Foundation	50	EA	\$ -	\$ -	\$ 7,500	\$ 372,750	\$ 7,500	\$ 372,750
3.9	Remove Existing Structure and Accessories	994	EA	\$ -	\$ -	\$ 12,500	\$ 12,425,000	\$ 12,500	\$ 12,425,000
3.10	Install Grounding and Grounding Accessories	932	Pole	\$ 506	\$ 471,592	\$ 5,539	\$ 5,161,882	\$ 6,045	\$ 5,633,474
<b>TOTAL - STRUCTURES:</b>					\$ 19,810,382		\$ 29,562,906		\$ 49,373,288
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSR "Cardinal" (Existing Structures 12.5 Miles)	2,241,994	LF	\$ 1.90	\$ 4,259,789	\$ 5.00	\$ 11,209,970	\$ 6.90	\$ 15,469,759
4.2	(1) OPGW 36 Fiber AC-33/38/571 (Existing Structures 12.5 Miles)	303,811	LF	\$ 1.35	\$ 410,145	\$ 5.00	\$ 1,519,055	\$ 6.35	\$ 1,929,200
4.3	(1) 3/8" EHS7 Steel (Existing Structures 12.5 Miles)	303,811	LF	\$ 0.47	\$ 142,791	\$ 5.00	\$ 1,519,055	\$ 5.47	\$ 1,661,846
4.4									
4.5									
4.6									
4.7	Remove Existing Conductor and Accessories	121.0	Mile	\$ -	\$ -	\$ 30,000	\$ 3,630,000	\$ 30,000.00	\$ 3,630,000
4.8	Remove Existing OPGW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.9	Remove Existing OHSW and Accessories	108.4	Mile	\$ -	\$ -	\$ 12,000	\$ 1,300,800	\$ 12,000.00	\$ 1,300,800
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16	Rider Poles (187 Locations)	93	Set	\$ 1,750	\$ 162,750	\$ 3,500	\$ 325,500	\$ 5,250.00	\$ 488,250
4.17	Rider Poles - Relocated	94	Set	\$ -	\$ -	\$ 3,500	\$ 329,000	\$ 3,500.00	\$ 329,000
4.18									
4.19									
4.20									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 4,975,475		\$ 21,134,180		\$ 26,109,655
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	2,418	Assembly	\$ 1,800	\$ 4,352,400	\$ 720	\$ 1,740,960	\$ 2,520	\$ 6,093,360
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	504	Assembly	\$ 1,800	\$ 907,200	\$ 720	\$ 362,880	\$ 2,520	\$ 1,270,080
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	403	Assembly	\$ 200	\$ 80,600	\$ 150	\$ 60,450	\$ 350	\$ 141,050
5.6	OPGW Assembly - Angle / DE	84	Assembly	\$ 250	\$ 21,000	\$ 150	\$ 12,600	\$ 400	\$ 33,600
5.7	OHSW Assembly - Tangent	403	Assembly	\$ 200	\$ 80,600	\$ 150	\$ 60,450	\$ 350	\$ 141,050
5.8	OHSW Assembly - Angle / DE	84	Assembly	\$ 250	\$ 21,000	\$ 150	\$ 12,600	\$ 400	\$ 33,600
5.9	OPGW Splice Boxes	27	Set	\$ 1,746	\$ 47,146	\$ 2,145	\$ 57,915	\$ 3,891	\$ 105,061
5.10	OPGW Splice & Test	27	EA	\$ 2,520	\$ 68,040	\$ 989	\$ 26,712	\$ 3,509	\$ 94,752
5.11	Spacer - Conductor	10,977	EA	\$ 50	\$ 548,850	\$ 35	\$ 384,195	\$ 85	\$ 933,045
5.12	Vibration Dampers - Conductor	2,635	EA	\$ 35	\$ 92,225	\$ 35	\$ 92,225	\$ 70	\$ 184,450
5.13	Shield wire / OPGW Dampers, Misc. Fittings	1,332	EA	\$ 27	\$ 35,964	\$ 35	\$ 46,620	\$ 62	\$ 82,584
5.14	Jumpers at Existing Structures (New Cable to Existing)	-	EA	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 50,000	\$ -
5.15	Replace - Mono Pole Vertical Tangent (1-Group of 18-Bells Each Assembly)	480	Assembly	\$ 1,800	\$ 864,000	\$ 720	\$ 345,600	\$ 2,520	\$ 1,209,600
5.16	Replace - Dead-end & Angle Insulators (1, Group of 18-Bells Each Assembly)	195	Assembly	\$ 1,800	\$ 351,000	\$ 720	\$ 140,400	\$ 2,520	\$ 491,400
5.17	Guys, Anchors, and Accessories	-	EA	\$ 719	\$ -	\$ 883	\$ -	\$ 1,602	\$ -
5.18	Misc. materials (Signs and Markers)	67.2	Mile	\$ 770	\$ 51,744	\$ 1,006	\$ 67,603	\$ 1,776	\$ 119,347
5.19		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 7,521,769		\$ 3,411,210		\$ 10,932,979
<b>A. Transmission Line Edic to Princetown</b>					\$ 39,291,432		\$ 108,663,945		\$ 147,955,377
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
Contractor Mobilization / Demobilization									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,479,554	\$ 1,479,554	\$ 1,479,554	\$ 1,479,554
Project Management, Material Handling & Amenities									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 6,378,874	\$ 6,378,874	\$ 6,378,874	\$ 6,378,874
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,479,554	\$ 1,479,554	\$ 1,479,554	\$ 1,479,554
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,479,554	\$ 1,479,554	\$ 1,479,554	\$ 1,479,554
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 7,397,769	\$ 7,397,769	\$ 7,397,769	\$ 7,397,769
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 443,866	\$ 443,866	\$ 443,866	\$ 443,866
6.7	Geotech	67	Location	\$ -	\$ -	\$ 3,500	\$ 234,500	\$ 3,500	\$ 234,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 1,035,688	\$ 1,035,688	\$ 1,035,688	\$ 1,035,688
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 443,866	\$ 443,866	\$ 443,866	\$ 443,866
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 6,782,000	\$ 6,782,000	\$ 6,782,000	\$ 6,782,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Compensation for use of 1 Ckt - NYPA Structures (92 Structures)	1	LS	\$ -	\$ -	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123	\$ 8,919,123
6.18	Sales Tax on Materials	1	LS	\$ 3,143,315	\$ 3,143,315	\$ -	\$ -	\$ 3,143,315	\$ 3,143,315
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 147,955	\$ 147,955	\$ 147,955	\$ 147,955
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 3,143,315		\$ 36,262,303		\$ 39,405,617

**ITC - T031 - (Segment A)**

**B. Transmission Line Princetown to Rotterdam**

Estimate Revision: **5**

Total: \$ **31,435,177**

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>B. Transmission Line Princetown to Rotterdam</b>			
1. CLEARING & ACCESS	\$ 2,250	\$ 4,182,670	\$ 4,184,920
2. FOUNDATIONS	\$ 1,369,010	\$ 5,146,318	\$ 6,515,328
3. STRUCTURES	\$ 4,480,770	\$ 5,315,291	\$ 9,796,061
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 773,826	\$ 2,903,455	\$ 3,677,281
5. INSULATORS, FITTINGS, HARDWARE	\$ 1,365,652	\$ 629,084	\$ 1,994,736
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 639,321	\$ 4,627,531	\$ 5,266,851
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>8,630,828</b>	\$ <b>22,804,349</b>	\$ <b>31,435,177</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>8,630,828</b>	\$ <b>22,804,349</b>	\$ <b>31,435,177</b>

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Princetown to Rotterdam</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	23.0	Acre	\$ -	\$ -	\$ 5,000	\$ 115,000	\$ 5,000	\$ 115,000
1.3	Access Road	5,280.0	LF	\$ -	\$ -	\$ 45	\$ 237,600	\$ 45	\$ 237,600
1.4	Silt Fence	26,400.0	LF	\$ -	\$ -	\$ 4	\$ 105,600	\$ 4	\$ 105,600
1.5	Matting - Access and ROW	21,120.0	LF	\$ -	\$ -	\$ 70	\$ 1,478,400	\$ 70	\$ 1,478,400
1.6	Matting - To Work Area	2,775.0	LF	\$ -	\$ -	\$ 70	\$ 194,250	\$ 70	\$ 194,250
1.7	Snow Removal	5.0	Mile	\$ -	\$ -	\$ 16,000	\$ 80,000	\$ 16,000	\$ 80,000
1.8	ROW Restoration	5.0	Mile	\$ -	\$ -	\$ 10,000	\$ 50,000	\$ 10,000	\$ 50,000
1.9	Work Pads	505,000.0	SF	\$ -	\$ -	\$ 4	\$ 1,777,600	\$ 4	\$ 1,777,600
1.10	Restoration for Work Pad areas	101,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 15,150	\$ 0	\$ 15,150
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	29.0	EA	\$ -	\$ -	\$ 4,130	\$ 119,770	\$ 4,130	\$ 119,770
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	3.0	EA	\$ 750	\$ 2,250	\$ 1,250	\$ 3,750	\$ 2,000	\$ 6,000
1.17	Concrete Washout Station	3.0	EA	\$ -	\$ -	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 2,250	\$ 4,182,670	\$ 4,184,920	\$	\$ 4,184,920
<b>2. FOUNDATIONS</b>									
2.1	Direct Embed - 345kV SC 2-Pole Steel H-Frame - V-String - Tangent	186	EA	\$ 1,635	\$ 304,087	\$ 11,117	\$ 2,067,790	\$ 12,752	\$ 2,371,877
2.2	Drilled Pier - 345KV SC Steel 3-Pole Deadend	18	EA	\$ 44,372	\$ 798,692	\$ 44,847	\$ 807,246	\$ 89,219	\$ 1,605,938
2.3	Drilled Pier - 345KV SC Steel 3-Pole Storm Deadend	6	EA	\$ 44,372	\$ 266,231	\$ 44,847	\$ 269,082	\$ 89,219	\$ 535,313
2.4									
2.5	Rock Excavation Adder	1,001.1	CY	\$ -	\$ -	\$ 2,000	\$ 2,002,200	\$ 2,000	\$ 2,002,200
2.6									
2.7									
2.8									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,369,010	\$ 5,146,318	\$ 6,515,328	\$	\$ 6,515,328
<b>3. STRUCTURES</b>									
3.1	Direct Embed - 345kV SC 2-Pole Steel H-Frame - V-String - Tangent	93	Structure	\$ 42,550	\$ 3,957,150	\$ 25,530	\$ 2,374,290	\$ 68,080	\$ 6,331,440
3.2	Drilled Pier - 345KV SC Steel 3-Pole Deadend	6	Structure	\$ 52,170	\$ 313,020	\$ 31,302	\$ 187,812	\$ 83,472	\$ 500,832
3.3	Drilled Pier - 345KV SC Steel 3-Pole Storm Deadend	2	Structure	\$ 52,170	\$ 104,340	\$ 31,302	\$ 62,604	\$ 83,472	\$ 166,944
3.4									
3.5									
3.6									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.7	Remove Existing Foundation	22	EA	\$ -	\$ -	\$ 7,500	\$ 165,000	\$ 7,500	\$ 165,000
3.8	Remove Existing Structure and Accessories	109	EA	\$ -	\$ -	\$ 12,500	\$ 1,362,500	\$ 12,500	\$ 1,362,500
3.9									
3.10	Install Grounding and Grounding Accessories	210	Pole	\$ 506	\$ 106,260	\$ 5,539	\$ 1,163,085	\$ 6,045	\$ 1,269,345
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 4,480,770		\$ 5,315,291		\$ 9,796,061
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSR "Cardinal"	339,293	LF	\$ 1.90	\$ 644,657	\$ 5.00	\$ 1,696,465	\$ 6.90	\$ 2,341,122
4.2	(1) OPGW 36 Fiber AC-33/38/571	56,549	LF	\$ 1.35	\$ 76,341	\$ 5.00	\$ 282,745	\$ 6.35	\$ 359,086
4.3	(1) 3/8" EHS7 Steel	56,549	LF	\$ 0.47	\$ 26,578	\$ 5.00	\$ 282,745	\$ 5.47	\$ 309,323
4.5	Remove Existing Conductor and Accessories	10.0	Mile	\$ -	\$ -	\$ 30,000	\$ 300,000	\$ 30,000.00	\$ 300,000
4.6	Remove Existing OPGW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.7	Remove Existing OHSW and Accessories	10.0	Mile	\$ -	\$ -	\$ 12,000	\$ 120,000	\$ 12,000.00	\$ 120,000
4.8	Rider Poles	15	Set	\$ 1,750	\$ 26,250	\$ 3,500	\$ 52,500	\$ 5,250.00	\$ 78,750
4.9	Rider Poles - Relocated	14	Set	\$ -	\$ -	\$ 3,500	\$ 49,000	\$ 3,500.00	\$ 49,000
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 773,826		\$ 2,903,455		\$ 3,677,281
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	558	Assembly	\$ 1,800	\$ 1,004,400	\$ 720	\$ 401,760	\$ 2,520	\$ 1,406,160
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	96	Assembly	\$ 1,800	\$ 172,800	\$ 720	\$ 69,120	\$ 2,520	\$ 241,920
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	93	Assembly	\$ 200	\$ 18,600	\$ 150	\$ 13,950	\$ 350	\$ 32,550
5.6	OPGW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.7	OHSW Assembly - Tangent	93	Assembly	\$ 200	\$ 18,600	\$ 150	\$ 13,950	\$ 350	\$ 32,550
5.8	OHSW Assembly - Angle / DE	16	Assembly	\$ 250	\$ 4,000	\$ 150	\$ 2,400	\$ 400	\$ 6,400
5.9	OPGW Splice Boxes	8	Set	\$ 1,750	\$ 14,000	\$ 1,746	\$ 13,969	\$ 3,496	\$ 27,969
5.10	OPGW Splice & Test	8	EA	\$ 1,400	\$ 11,200	\$ 2,520	\$ 20,160	\$ 3,920	\$ 31,360
5.11	Spacer - Conductor	1,919	EA	\$ 50	\$ 95,950	\$ 35	\$ 67,165	\$ 85	\$ 163,115
5.12	Vibration Dampers - Conductor	432	EA	\$ 35	\$ 15,120	\$ 35	\$ 15,120	\$ 70	\$ 30,240
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	116	EA	\$ 27	\$ 3,132	\$ 35	\$ 4,060	\$ 62	\$ 7,192
5.14	Jumpers at Existing Structures (New Cable to Existing)	-	EA	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 50,000	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 719	\$ -	\$ 883	\$ -	\$ 1,602	\$ -
5.16	Misc. materials (Signs and Markers)	5.0	Mile	\$ 770	\$ 3,850	\$ 1,006	\$ 5,030	\$ 1,776	\$ 8,880
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 1,365,652		\$ 629,084		\$ 1,994,736
<b>B. Transmission Line Princetown to Rotterdam</b>					\$ 7,991,508		\$ 18,176,818		\$ 26,168,326
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 261,683	\$ 261,683	\$ 261,683	\$ 261,683
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,128,208	\$ 1,128,208	\$ 1,128,208	\$ 1,128,208
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 261,683	\$ 261,683	\$ 261,683	\$ 261,683
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 261,683	\$ 261,683	\$ 261,683	\$ 261,683
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,308,416	\$ 1,308,416	\$ 1,308,416	\$ 1,308,416
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 78,505	\$ 78,505	\$ 78,505	\$ 78,505
6.7	Geotech	5	Location	\$ -	\$ -	\$ 3,500	\$ 17,500	\$ 3,500	\$ 17,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 183,178	\$ 183,178	\$ 183,178	\$ 183,178
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 78,505	\$ 78,505	\$ 78,505	\$ 78,505
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 982,000	\$ 982,000	\$ 982,000	\$ 982,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 639,321	\$ 639,321	\$ -	\$ -	\$ 639,321	\$ 639,321
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 26,168	\$ 26,168	\$ 26,168	\$ 26,168
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 639,321		\$ 4,627,531		\$ 5,266,851

**ITC - T031 - (Segment A)**

**C. Transmission Line Princetown to New Scotland**

Estimate Revision: 5

Total: \$ 76,758,803

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>C. Transmission Line Princetown to New Scotland</b>			
1. CLEARING & ACCESS	\$ 31,000	\$ 11,532,694	\$ 11,563,694
2. FOUNDATIONS	\$ 5,878,220	\$ 6,905,973	\$ 12,784,193
3. STRUCTURES	\$ 10,575,689	\$ 10,875,263	\$ 21,450,952
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,759,967	\$ 8,977,795	\$ 11,737,762
5. INSULATORS, FITTINGS, HARDWARE	\$ 3,933,818	\$ 1,753,268	\$ 5,687,086
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,854,296	\$ 11,680,821	\$ 13,535,116
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 25,032,990</b>	<b>\$ 51,725,813</b>	<b>\$ 76,758,803</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 25,032,990</b>	<b>\$ 51,725,813</b>	<b>\$ 76,758,803</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Transmission Line Princetown to New Scotland</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	26.0	Acre	\$ -	\$ -	\$ 15,000	\$ 390,000	\$ 15,000	\$ 390,000
1.2	Clearing the ROW - Light (mowing)	62.0	Acre	\$ -	\$ -	\$ 5,000	\$ 310,000	\$ 5,000	\$ 310,000
1.3	Access Road	20,803.2	LF	\$ -	\$ -	\$ 45	\$ 936,144	\$ 45	\$ 936,144
1.4	Silt Fence	104,016.0	LF	\$ -	\$ -	\$ 4	\$ 416,064	\$ 4	\$ 416,064
1.5	Matting - Access and ROW	83,212.8	LF	\$ -	\$ -	\$ 70	\$ 5,824,896	\$ 70	\$ 5,824,896
1.6	Matting - To Work Area	3,375.0	LF	\$ -	\$ -	\$ 70	\$ 236,250	\$ 70	\$ 236,250
1.7	Snow Removal	19.7	Mile	\$ -	\$ -	\$ 16,000	\$ 315,200	\$ 16,000	\$ 315,200
1.8	ROW Restoration	19.7	Mile	\$ -	\$ -	\$ 10,000	\$ 197,000	\$ 10,000	\$ 197,000
1.9	Work Pads	725,000	SF	\$ -	\$ -	\$ 4	\$ 2,552,000	\$ 4	\$ 2,552,000
1.10	Restoration for Work Pad areas	145,000	SF	\$ -	\$ -	\$ 0.2	\$ 21,750	\$ 0	\$ 21,750
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	2	EA	\$ -	\$ -	\$ 14,445	\$ 28,890	\$ 14,445	\$ 28,890
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	50	EA	\$ -	\$ -	\$ 4,130	\$ 206,500	\$ 4,130	\$ 206,500
1.15	Gates	11	EA	\$ 2,000	\$ 22,000	\$ 2,500	\$ 27,500	\$ 4,500	\$ 49,500
1.16	Culverts / Misc. Access	12	EA	\$ 750	\$ 9,000	\$ 1,250	\$ 15,000	\$ 2,000	\$ 24,000
1.17	Concrete Washout Station	30	EA	\$ -	\$ -	\$ 1,850	\$ 55,500	\$ 1,850	\$ 55,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 31,000		\$ 11,532,694		\$ 11,563,694
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV DC Steel Mono-Pole Delta - V-String - Tangent	131	EA	\$ 26,483	\$ 3,469,324	\$ 26,767	\$ 3,506,479	\$ 53,250	\$ 6,975,803
2.2	Drilled Pier - 345KV DC Steel 2-Pole Delta - Deadend	20	EA	\$ 86,032	\$ 1,720,640	\$ 86,953	\$ 1,739,067	\$ 172,985	\$ 3,459,707
2.3	Drilled Pier - 345KV DC Steel 2-Pole Delta Storm - Deadend	8	EA	\$ 86,032	\$ 688,256	\$ 86,953	\$ 695,627	\$ 172,985	\$ 1,383,883
2.4									
2.5	Rock Excavation Adder	482.4	CY	\$ -	\$ -	\$ 2,000	\$ 964,800	\$ 2,000	\$ 964,800
2.6									
2.7									
2.8									
2.9									
2.10									
<b>TOTAL - FOUNDATIONS:</b>					\$ 5,878,220		\$ 6,905,973		\$ 12,784,193
<b>3. STRUCTURES</b>									
3.1	Drilled Pier - 345KV DC Steel Mono-Pole Delta - V-String - Tangent	131	Structure	\$ 69,005	\$ 9,039,655	\$ 41,403	\$ 5,423,793	\$ 110,408	\$ 14,463,448
3.2	Drilled Pier - 345KV DC Steel 2-Pole Delta - Deadend	10	Structure	\$ 103,970	\$ 1,039,700	\$ 62,382	\$ 623,820	\$ 166,352	\$ 1,663,520
3.3	Drilled Pier - 345KV DC Steel 2-Pole Delta Storm - Deadend	4	Structure	\$ 103,970	\$ 415,880	\$ 62,382	\$ 249,528	\$ 166,352	\$ 665,408
3.4									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.5	Remove Existing Foundation	348	EA	\$ -	\$ -	\$ 7,500	\$ 2,610,000	\$ 7,500	\$ 2,610,000
3.6	Remove Existing Structure and Accessories	87	EA	\$ -	\$ -	\$ 12,500	\$ 1,087,500	\$ 12,500	\$ 1,087,500
3.7									
3.8	Install Grounding and Grounding Accessories	159	Pole	\$ 506	\$ 80,454	\$ 5,539	\$ 880,622	\$ 6,045	\$ 961,076
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
3.16									
3.17									
3.18									
3.19									
3.20									
<b>TOTAL - STRUCTURES:</b>					\$ 10,575,689		\$ 10,875,263		\$ 21,450,952
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSR "Cardinal"	1,323,907	LF	\$ 1.90	\$ 2,515,423	\$ 5.00	\$ 6,619,535	\$ 6.90	\$ 9,134,958
4.2	(1) OPGW 36 Fiber AC-33/38/571	110,326	LF	\$ 1.35	\$ 148,940	\$ 5.00	\$ 551,630	\$ 6.35	\$ 700,570
4.3	(1) 3/8" EHS7 Steel	110,326	LF	\$ 0.47	\$ 51,853	\$ 5.00	\$ 551,630	\$ 5.47	\$ 603,483
4.4	Remove Existing Conductor and Accessories	20.0	Mile	\$ -	\$ -	\$ 30,000	\$ 600,000	\$ 30,000.00	\$ 600,000
4.5	Remove Existing OPGW and Accessories	20.0	Mile	\$ -	\$ -	\$ 12,000	\$ 240,000	\$ 12,000.00	\$ 240,000
4.6	Remove Existing OHSW and Accessories	20.0	Mile	\$ -	\$ -	\$ 12,000	\$ 240,000	\$ 12,000.00	\$ 240,000
4.7	Rider Poles	25	EA	\$ 1,750	\$ 43,750	\$ 3,500	\$ 87,500	\$ 5,250.00	\$ 131,250
4.8	Rider Poles - Relocated	25	Set	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500.00	\$ 87,500
4.9									
4.10									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,759,967		\$ 8,977,795		\$ 11,737,762
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,572	Assembly	\$ 1,800	\$ 2,829,600	\$ 720	\$ 1,131,840	\$ 2,520	\$ 3,961,440
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	336	Assembly	\$ 1,800	\$ 604,800	\$ 720	\$ 241,920	\$ 2,520	\$ 846,720
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	131	Assembly	\$ 200	\$ 26,200	\$ 150	\$ 19,650	\$ 350	\$ 45,850
5.6	OPGW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.7	OHSW Assembly - Tangent	131	Assembly	\$ 200	\$ 26,200	\$ 150	\$ 19,650	\$ 350	\$ 45,850
5.8	OHSW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.9	OPGW Splice Boxes	3	Set	\$ 1,746	\$ 5,238	\$ 2,145	\$ 6,435	\$ 3,891	\$ 11,673
5.10	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 989	\$ 7,915	\$ 3,509	\$ 28,075
5.11	Spacer - Conductor	6,533	EA	\$ 50	\$ 326,650	\$ 35	\$ 228,655	\$ 85	\$ 555,305
5.12	Vibration Dampers - Conductor	1,573	EA	\$ 35	\$ 55,055	\$ 35	\$ 55,055	\$ 70	\$ 110,110
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	398	EA	\$ 27	\$ 10,746	\$ 35	\$ 13,930	\$ 62	\$ 24,676
5.14	Guys, Anchors, and Accessories	-	EA	\$ 719	\$ -	\$ 883	\$ -	\$ 1,602	\$ -
5.15	Misc. materials (Signs and Markers)	19.7	Mile	\$ 770	\$ 15,169	\$ 1,006	\$ 19,818	\$ 1,776	\$ 34,987
5.16	Jumpers at Existing Structures (New Cable to Existing)	-	EA	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 50,000	\$ -
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 3,933,818		\$ 1,753,268		\$ 5,687,086
<b>C. Transmission Line Princetown to New Scotland</b>					\$ 23,178,694		\$ 40,044,992		\$ 63,223,686
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 632,237	\$ 632,237	\$ 632,237	\$ 632,237
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,725,794	\$ 2,725,794	\$ 2,725,794	\$ 2,725,794
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 632,237	\$ 632,237	\$ 632,237	\$ 632,237
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 632,237	\$ 632,237	\$ 632,237	\$ 632,237
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,161,184	\$ 3,161,184	\$ 3,161,184	\$ 3,161,184

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 189,671	\$ 189,671	\$ 189,671	\$ 189,671
6.7	Geotech	20	Location	\$ -	\$ -	\$ 3,500	\$ 70,000	\$ 3,500	\$ 70,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 442,566	\$ 442,566	\$ 442,566	\$ 442,566
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 189,671	\$ 189,671	\$ 189,671	\$ 189,671
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ 215,000	\$ 215,000	\$ 215,000	\$ 215,000
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,687,000	\$ 2,687,000	\$ 2,687,000	\$ 2,687,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,854,296	\$ 1,854,296	\$ -	\$ -	\$ 1,854,296	\$ 1,854,296
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 63,224	\$ 63,224	\$ 63,224	\$ 63,224
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,854,296	\$ -	\$ 11,680,821		\$ 13,535,116

**ITC - T031 - (Segment A)**

**D. Rotterdam Substation - Install**

Estimate Revision: **5** Total: \$ **24,565,575**

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>D. Rotterdam Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 189,890	\$ 2,766,050	\$ 2,955,940
2. SUBSTATION FOUNDATIONS	\$ 1,035,342	\$ 1,108,800	\$ 2,144,142
3. SUBSTATION STRUCTURES	\$ 432,900	\$ 432,900	\$ 865,800
4. MAJOR EQUIPMENT	\$ 7,515,000	\$ 1,820,000	\$ 9,335,000
5. SMALL EQUIPMENT / MATERIALS	\$ 673,000	\$ 333,000	\$ 1,006,000
6. CONTROL HOUSE / PANELS	\$ 893,900	\$ 818,900	\$ 1,712,800
7. MISC ITEMS	\$ 744,510	\$ 1,040,740	\$ 1,785,250
8. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 918,763	\$ 3,841,880	\$ 4,760,643
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 12,403,305</b>	<b>\$ 12,162,270</b>	<b>\$ 24,565,575</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 12,403,305</b>	<b>\$ 12,162,270</b>	<b>\$ 24,565,575</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Rotterdam Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	1.3	ACRES	\$ -	\$ -	\$ 1,300,000	\$ 1,625,000	\$ 1,300,000	\$ 1,625,000
1.2	Station stone within substation fence.	1,170	CY	\$ 27	\$ 31,590	\$ 75	\$ 87,750	\$ 102	\$ 119,340
1.3	Substation Fence	1,100	LF	\$ 100	\$ 110,000	\$ 100	\$ 110,000	\$ 200	\$ 220,000
1.4	Permanent Access Road - 20'-Wide (From Gordon RD)	1,380	LF	\$ 35	\$ 48,300	\$ 285	\$ 393,300	\$ 320	\$ 441,600
1.5									
1.6									
1.7	Natural Gas Transmission Line Relocation	1	LS	\$ -		\$ 550,000	\$ 550,000	\$ 550,000	\$ 550,000
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 189,890		\$ 2,766,050		\$ 2,955,940
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 26,145	\$ 209,160	\$ 28,000	\$ 224,000	\$ 54,145	\$ 433,160
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	40	EA	\$ 4,482	\$ 179,280	\$ 4,800	\$ 192,000	\$ 9,282	\$ 371,280
2.1f	Station Service Transformer Stand Foundation	4	EA	\$ 4,482	\$ 17,928	\$ 4,800	\$ 19,200	\$ 9,282	\$ 37,128
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	14	EA	\$ 4,482	\$ 62,748	\$ 4,800	\$ 67,200	\$ 9,282	\$ 129,948
2.1j	Instrument Transformer Stand Foundations	18	EA	\$ 4,482	\$ 80,676	\$ 4,800	\$ 86,400	\$ 9,282	\$ 167,076
2.1k	Arrester Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1m	Wave Trap Stand Foundations	2	EA	\$ 4,482	\$ 8,964	\$ 4,800	\$ 9,600	\$ 9,282	\$ 18,564
2.1n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	1	EA	\$ 11,952	\$ 11,952	\$ 12,800	\$ 12,800	\$ 24,752	\$ 24,752
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	8	EA	\$ 3,735	\$ 29,880	\$ 4,000	\$ 32,000	\$ 7,735	\$ 61,880
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	9	EA	\$ 3,735	\$ 33,615	\$ 4,000	\$ 36,000	\$ 7,735	\$ 69,615
2.2j	Instrument Transformer Stand Foundations	3	EA	\$ 3,735	\$ 11,205	\$ 4,000	\$ 12,000	\$ 7,735	\$ 23,205
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 16,434	\$ 65,736	\$ 17,600	\$ 70,400	\$ 34,034	\$ 136,136
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	2	EA	\$ 97,110	\$ 194,220	\$ 104,000	\$ 208,000	\$ 201,110	\$ 402,220
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,035,342		\$ 1,108,800		\$ 2,144,142
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	2	EA	\$ 37,000	\$ 74,000	\$ 37,000	\$ 74,000	\$ 74,000	\$ 148,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	8	EA	\$ 14,800	\$ 118,400	\$ 14,800	\$ 118,400	\$ 29,600	\$ 236,800
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	14	EA	\$ 3,700	\$ 51,800	\$ 3,700	\$ 51,800	\$ 7,400	\$ 103,600
3.1g	Instrument Transformer Stand	18	EA	\$ 1,850	\$ 33,300	\$ 1,850	\$ 33,300	\$ 3,700	\$ 66,600
3.1h	Arrester Stand	6	EA	\$ 1,850	\$ 11,100	\$ 1,850	\$ 11,100	\$ 3,700	\$ 22,200
3.1j	Wave Trap Stand	2	EA	\$ 7,400	\$ 14,800	\$ 7,400	\$ 14,800	\$ 14,800	\$ 29,600
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	2	EA	\$ 12,025	\$ 24,050	\$ 12,025	\$ 24,050	\$ 24,050	\$ 48,100
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	9	EA	\$ 2,775	\$ 24,975	\$ 2,775	\$ 24,975	\$ 5,550	\$ 49,950
3.2g	Instrument Transformer Stand	3	EA	\$ 1,295	\$ 3,885	\$ 1,295	\$ 3,885	\$ 2,590	\$ 7,770
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	2	EA	\$ 7,955	\$ 15,910	\$ 7,955	\$ 15,910	\$ 15,910	\$ 31,820
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 432,900		\$ 432,900		\$ 865,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	2	EA	\$ 3,400,000	\$ 6,800,000	\$ 750,000	\$ 1,500,000	\$ 4,150,000	\$ 8,300,000
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ 3,400,000	\$ -	\$ 750,000	\$ -	\$ 4,150,000	\$ -
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	1	EA	\$ 115,000	\$ 115,000	\$ 80,000	\$ 80,000	\$ 195,000	\$ 195,000
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 7,515,000		\$ 1,820,000		\$ 9,335,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	2	EA	\$ 40,000	\$ 80,000	\$ 15,000	\$ 30,000	\$ 55,000	\$ 110,000
5.1b	Disconnect Switches - 3ph w/ manual operator	6	EA	\$ 35,000	\$ 210,000	\$ 17,500	\$ 105,000	\$ 52,500	\$ 315,000
5.1c	VT'S	6	EA	\$ 25,000	\$ 150,000	\$ 12,000	\$ 72,000	\$ 37,000	\$ 222,000
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	2	EA	\$ 30,000	\$ 60,000	\$ 17,500	\$ 35,000	\$ 47,500	\$ 95,000
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	3	EA	\$ 10,000	\$ 30,000	\$ 6,000	\$ 18,000	\$ 16,000	\$ 48,000
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 673,000		\$ 333,000		\$ 1,006,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 85,000	\$ -	\$ 85,000	\$ -
6.2	Protection and Telecom Equipment Panels	8	EA	\$ 35,000	\$ 280,000	\$ 10,000	\$ 80,000	\$ 45,000	\$ 360,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 438,900	\$ 438,900	\$ 438,900	\$ 438,900	\$ 877,800	\$ 877,800
6.5	SCADA and Communications	1	EA	\$ 75,000	\$ 75,000	\$ 100,000	\$ 100,000	\$ 175,000	\$ 175,000
6.6	Low Voltage AC Distribution	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.7	DC Distribution System	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 893,900		\$ 818,900		\$ 1,712,800
<b>7. MISC ITEMS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.1	Conduit & Cable Trench System	1,400	LF	\$ 185.00	\$ 259,000	\$ 170.00	\$ 238,000	\$ 355	\$ 497,000
7.2	Rigid Bus, Fittings & Insulators	1,000	LF	\$ 125.07	\$ 125,070	\$ 237.10	\$ 237,100	\$ 362	\$ 362,170
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 39.30	\$ -	\$ 53.35	\$ -	\$ 93	\$ -
7.4	Grounding System	8,000	LF	\$ 6.93	\$ 55,440	\$ 32.58	\$ 260,640	\$ 40	\$ 316,080
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
<b>TOTAL - MISC ITEMS</b>					\$ 744,510		\$ 1,040,740		\$ 1,785,250
<b>D. Rotterdam Substation - Install</b>					\$ 11,484,542		\$ 8,320,390		\$ 19,804,932
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 198,049	\$ 198,049	\$ 198,049	\$ 198,049
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 853,860	\$ 853,860	\$ 853,860	\$ 853,860
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 198,049	\$ 198,049	\$ 198,049	\$ 198,049
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 198,049	\$ 198,049	\$ 198,049	\$ 198,049
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,584,395	\$ 1,584,395	\$ 1,584,395	\$ 1,584,395
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 138,635	\$ 138,635	\$ 138,635	\$ 138,635
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 495,123	\$ 495,123	\$ 495,123	\$ 495,123
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 59,415	\$ 59,415	\$ 59,415	\$ 59,415
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 82,500	\$ 82,500	\$ 82,500	\$ 82,500
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 918,763	\$ 918,763	\$ -	\$ -	\$ 918,763	\$ 918,763
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 19,805	\$ 19,805	\$ 19,805	\$ 19,805

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:					\$ 918,763		\$ 3,841,880		\$ 4,760,643

**ITC - T031 - (Segment A)**

**F. Edic Substation - Install**

Estimate Revision: **5**

Total: \$ **2,660,300**

<i>ITC - T031 - (Segment A)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>F. Edic Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 2,025	\$ 5,625	\$ 7,650
2. SUBSTATION FOUNDATIONS	\$ 100,098	\$ 107,200	\$ 207,298
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 280,000	\$ 133,500	\$ 413,500
6. CONTROL HOUSE / PANELS	\$ 173,500	\$ 130,800	\$ 304,300
7. MISC ITEMS	\$ 339,357	\$ 507,880	\$ 847,237
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 91,150	\$ 420,364	\$ 511,515
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,230,530	\$ 1,429,769	\$ 2,660,300
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,230,530	\$ 1,429,769	\$ 2,660,300

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Edic Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide (From Gordon RD)	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 2,025		\$ 5,625		\$ 7,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad (40'x125')	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 100,098		\$ 107,200		\$ 207,298
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e									
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	6	EA	\$ 6,500	\$ 39,000	\$ 1,500	\$ 9,000	\$ 8,000	\$ 48,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 280,000		\$ 133,500		\$ 413,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 10,000	\$ 30,000	\$ 45,000	\$ 135,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 68,500	\$ 68,500	\$ 100,800	\$ 100,800	\$ 169,300	\$ 169,300
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 173,500		\$ 130,800		\$ 304,300
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	L.S.	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	L.S.	\$ 125.07	\$ -	\$ 237.10	\$ -	\$ 362	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500.0	L.S.	\$ 39.30	\$ 98,250	\$ 53.35	\$ 133,375	\$ 93	\$ 231,625
7.4	Grounding System	1	L.S.	\$ 10,395.00	\$ 10,395	\$ 73,305.00	\$ 73,305	\$ 83,700	\$ 83,700
7.5	Strain Bus Insulators - 345kV	24	EA	\$ 2,000	\$ 48,000	\$ 1,050	\$ 25,200	\$ 3,050	\$ 73,200
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 339,357		\$ 507,880		\$ 847,237
<b>F. Edic Substation - Install</b>					\$ 1,139,380		\$ 1,009,405		\$ 2,148,785
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 21,488	\$ 21,488	\$ 21,488	\$ 21,488
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (Includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 92,642	\$ 92,642	\$ 92,642	\$ 92,642
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 21,488	\$ 21,488	\$ 21,488	\$ 21,488
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 21,488	\$ 21,488	\$ 21,488	\$ 21,488
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 171,903	\$ 171,903	\$ 171,903	\$ 171,903
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 15,041	\$ 15,041	\$ 15,041	\$ 15,041
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 53,720	\$ 53,720	\$ 53,720	\$ 53,720
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,446	\$ 6,446	\$ 6,446	\$ 6,446
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 91,150	\$ 91,150	\$ -	\$ -	\$ 91,150	\$ 91,150
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,149	\$ 2,149	\$ 2,149	\$ 2,149
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 91,150		\$ 420,364		\$ 511,515

**ITC - T031 - (Segment A)**

**G. Edic Substation - Removal**

Estimate Revision: 5

Total: \$ 41,562

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>G. Edic Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 14,200	\$ 14,200
3. SUBSTATION STRUCTURES	\$ -	\$ 6,750	\$ 6,750
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 4,500	\$ 4,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 10,500	\$ 10,500
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 5,612	\$ 5,612
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 41,562	\$ 41,562
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 41,562	\$ 41,562

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Edic Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 14,200	\$ 14,200	\$ 14,200	\$ 14,200
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 14,200		\$ 14,200
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	3	EA	\$ -	\$ -	\$ 2,250	\$ 6,750	\$ 2,250	\$ 6,750
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 6,750		\$ 6,750
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 4,500		\$ 4,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ -	\$ -	\$ 10,500.00	\$ 10,500	\$ 10,500	\$ 10,500
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 10,500		\$ 10,500
<b>G. Edic Substation - Removal</b>					\$ -		\$ 35,950		\$ 35,950
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,550	\$ 1,550	\$ 1,550	\$ 1,550
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 360	\$ 360	\$ 360	\$ 360
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 360	\$ 360	\$ 360	\$ 360
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,876	\$ 2,876	\$ 2,876	\$ 2,876
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 252	\$ -	\$ 252	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 899	\$ -	\$ 899	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 108	\$ 108	\$ 108	\$ 108
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ 36	\$ -	\$ 36	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 5,612		\$ 5,612

**ITC - T031 - (Segment A)**

**H. New Scotland Substation - Install**

Estimate Revision: 5

Total: \$ 4,466,540

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>H. New Scotland Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 4,050	\$ 112,750	\$ 116,800
2. SUBSTATION FOUNDATIONS	\$ 283,113	\$ 303,200	\$ 586,313
3. SUBSTATION STRUCTURES	\$ 114,700	\$ 114,700	\$ 229,400
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 260,500	\$ 129,000	\$ 389,500
6. CONTROL HOUSE / PANELS	\$ 471,950	\$ 210,700	\$ 682,650
7. MISC ITEMS	\$ 596,373	\$ 733,493	\$ 1,329,866
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 154,455	\$ 697,556	\$ 852,011
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 2,085,140	\$ 2,381,399	\$ 4,466,540
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 2,085,140	\$ 2,381,399	\$ 4,466,540

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. New Scotland Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0.50	ACRES	\$ -	\$ -	\$ 203,000	\$ 101,500	\$ 203,000	\$ 101,500
1.2	Station stone within substation fence.	150	CY	\$ 27	\$ 4,050	\$ 75	\$ 11,250	\$ 102	\$ 15,300
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 4,050		\$ 112,750		\$ 116,800
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad 25' x 50'	1	EA	\$ 27,639	\$ 27,639	\$ 29,600	\$ 29,600	\$ 57,239	\$ 57,239
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 283,113		\$ 303,200		\$ 586,313
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	9	EA	\$ 3,700	\$ 33,300	\$ 3,700	\$ 33,300	\$ 7,400	\$ 66,600
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 114,700		\$ 114,700		\$ 229,400
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 8,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 30,000	\$ -	\$ 15,000	\$ -	\$ 45,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 28,000	\$ -	\$ 15,000	\$ -	\$ 43,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 33,000	\$ -	\$ 17,500	\$ -	\$ 50,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 260,500		\$ 129,000		\$ 389,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 243,750	\$ 243,750	\$ 42,500	\$ 42,500	\$ 286,250	\$ 286,250
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 15,000	\$ 45,000	\$ 50,000	\$ 150,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 123,200	\$ 123,200	\$ 123,200	\$ 123,200	\$ 246,400	\$ 246,400
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 471,950		\$ 210,700		\$ 682,650
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,200.0	LF	\$ 185.00	\$ 222,000	\$ 170.00	\$ 204,000	\$ 355	\$ 426,000
7.2	Rigid Bus, Fittings & Insulators	180.0	LF	\$ 125.07	\$ 22,513	\$ 237.10	\$ 42,678	\$ 362	\$ 65,191
7.3	Strain Bus, Connectors & Insulators	100.0	LF	\$ 39.30	\$ 3,930	\$ 53.35	\$ 5,335	\$ 93	\$ 9,265
7.4	Grounding System	1,000.0	LF	\$ 6.93	\$ 6,930	\$ 32.58	\$ 32,580	\$ 40	\$ 39,510
7.5	Strain Bus Insulators - 345kV	18	EA	\$ 2,000	\$ 36,000	\$ 1,050	\$ 18,900	\$ 3,050	\$ 54,900
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10									
7.11	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.12	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.13	Install new communication tower foundation.	1	LS		\$ -	\$ 75,000	\$ 75,000	\$ 75,000	\$ 75,000
7.14	Relocate existing communication tower.	1	LS		\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 596,373		\$ 733,493		\$ 1,329,866
<b>H. New Scotland Substation - Install</b>					\$ 1,930,686		\$ 1,683,843		\$ 3,614,529
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 36,145	\$ 36,145	\$ 36,145	\$ 36,145
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 155,835	\$ 155,835	\$ 155,835	\$ 155,835
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 36,145	\$ 36,145	\$ 36,145	\$ 36,145
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 36,145	\$ 36,145	\$ 36,145	\$ 36,145
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 289,162	\$ 289,162	\$ 289,162	\$ 289,162
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 25,302	\$ 25,302	\$ 25,302	\$ 25,302
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 90,363	\$ 90,363	\$ 90,363	\$ 90,363
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 10,844	\$ 10,844	\$ 10,844	\$ 10,844
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 154,455	\$ 154,455	\$ -	\$ -	\$ 154,455	\$ 154,455
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 3,615	\$ 3,615	\$ 3,615	\$ 3,615
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 154,455		\$ 697,556		\$ 852,011

**ITC - T031 - (Segment A)**

**J. Porter Substation - Install**

Estimate Revision: 5

Total: \$ 86,137

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>J. Porter Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ 15,008	\$ 56,904	\$ 71,912
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,201	\$ 13,024	\$ 14,225
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 16,209	\$ 69,928	\$ 86,137
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 16,209	\$ 69,928	\$ 86,137

**Description of Work:**

**J. Porter Substation - Install**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 100	\$ -	\$ 100	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -

<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -	\$ -	\$ -	\$ -	\$ -
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 300,000	\$ -	\$ 80,000	\$ -	\$ 380,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 225,000	\$ -	\$ 60,000	\$ -	\$ 285,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 40,000	\$ -	\$ 17,500	\$ -	\$ 57,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 30,000	\$ -	\$ 15,000	\$ -	\$ 45,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 28,000	\$ -	\$ 15,000	\$ -	\$ 43,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 33,000	\$ -	\$ 17,500	\$ -	\$ 50,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ 35,000	\$ -	\$ 10,000	\$ -	\$ 45,000	\$ -
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	0	LS	\$ 35,000	\$ -	\$ 12,500	\$ -	\$ 47,500	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	LF	\$ 185.00	\$ -	\$ 170.00	\$ -	\$ 355	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	LS	\$ 15,008.40	\$ 15,008	\$ 56,904.00	\$ 56,904	\$ 71,912	\$ 71,912
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Cables	0	LS	\$ 472,500	\$ -	\$ 472,500	\$ -	\$ 945,000	\$ -
7.11	Control Conduits from Trench to Equipment	0	LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.12	Misc. Materials (Above and Below Ground)	0	LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
<b>TOTAL - MISC ITEMS</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>J. Porter Substation - Install</b>					\$ 15,008		\$ 56,904		\$ 71,912
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS	\$ -	\$ -	\$ 3,100	\$ 3,100	\$ 3,100	\$ 3,100
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 719	\$ 719	\$ 719	\$ 719
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,753	\$ 5,753	\$ 5,753	\$ 5,753
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 503	\$ -	\$ 503	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 1,798	\$ 1,798	\$ 1,798	\$ 1,798
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 216	\$ 216	\$ 216	\$ 216
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,201	\$ 1,201	\$ -	\$ -	\$ 1,201	\$ 1,201
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 72	\$ -	\$ 72	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,201		\$ 13,024		\$ 14,225

**ITC - T031 - (Segment A)**

**K. Porter Substation - Removal**

Estimate Revision: **5**

Total: \$ **548,359**

<i>ITC - T031 - (Segment A)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>K. Porter Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 126,600	\$ 126,600
3. SUBSTATION STRUCTURES	\$ -	\$ 206,100	\$ 206,100
4. MAJOR EQUIPMENT	\$ -	\$ 43,500	\$ 43,500
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 59,500	\$ 59,500
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ 38,613	\$ 38,613
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 74,047	\$ 74,047
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 548,359	\$ 548,359
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 548,359	\$ 548,359

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Porter Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	3	EA	\$ -	\$ -	\$ 7,200	\$ 21,600	\$ 7,200	\$ 21,600
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	5	EA	\$ -	\$ -	\$ 11,000	\$ 55,000	\$ 11,000	\$ 55,000
2.2e	Switch Stand Foundations	5	EA	\$ -	\$ -	\$ 5,200	\$ 26,000	\$ 5,200	\$ 26,000
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	4	EA	\$ -	\$ -	\$ 2,400	\$ 9,600	\$ 2,400	\$ 9,600
2.2k	Arrester Stand Foundations	6	EA	\$ -	\$ -	\$ 2,400	\$ 14,400	\$ 2,400	\$ 14,400
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 126,600		\$ 126,600
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	5	EA	\$ -	\$ -	\$ 27,000	\$ 135,000	\$ 27,000	\$ 135,000
3.2c	Switch Stands	6	EA	\$ -	\$ -	\$ 9,750	\$ 58,500	\$ 9,750	\$ 58,500
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2h	Arrester Stand	6	EA	\$ -	\$ -	\$ 1,050	\$ 6,300	\$ 1,050	\$ 6,300
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 206,100		\$ 206,100
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	3	EA	\$ -	\$ -	\$ 14,500	\$ 43,500	\$ 14,500	\$ 43,500
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 43,500		\$ 43,500
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	2	EA	\$ -	\$ -	\$ 5,500	\$ 11,000	\$ 5,500	\$ 11,000
5.2b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.2c	VT'S	2	EA	\$ -	\$ -	\$ 1,500	\$ 3,000	\$ 1,500	\$ 3,000
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	6	EA	\$ -	\$ -	\$ 1,500	\$ 9,000	\$ 1,500	\$ 9,000
5.2f	Arresters	6	EA	\$ -	\$ -	\$ 2,500	\$ 15,000	\$ 2,500	\$ 15,000
5.2g	Wave Traps	2	EA	\$ -	\$ -	\$ 2,500	\$ 5,000	\$ 2,500	\$ 5,000
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 59,500		\$ 59,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	1	L.S.	\$ -	\$ -	\$ 18,937.50	\$ 18,938	\$ 18,938	\$ 18,938
7.3	Strain Bus, Connectors & Insulators	1	L.S.	\$ -	\$ -	\$ 19,675.00	\$ 19,675	\$ 19,675	\$ 19,675
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 38,613		\$ 38,613
<b>K. Porter Substation - Removal</b>					\$ -		\$ 474,313		\$ 474,313
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS		\$ -	\$ 20,449	\$ 20,449	\$ 20,449	\$ 20,449
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 4,743	\$ 4,743	\$ 4,743	\$ 4,743
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 37,945	\$ 37,945	\$ 37,945	\$ 37,945
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 3,320	\$ -	\$ 3,320	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 11,858	\$ -	\$ 11,858	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,423	\$ 1,423	\$ 1,423	\$ 1,423
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ 474	\$ -	\$ 474	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 74,047		\$ 74,047

**ITC - T031 - (Segment A)**

**L. Interconnection Edic Station**

Estimate Revision: **5** Total: \$ **2,113,230**

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>L. Interconnection Edic Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 168,366	\$ 170,169	\$ 338,536
3. STRUCTURES	\$ 501,469	\$ 321,821	\$ 823,289
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 160,000	\$ 94,400	\$ 254,400
6. MOB/DEMOP, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 66,387	\$ 262,769	\$ 329,155
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,217,009</b>	\$ <b>2,113,230</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>896,222</b>	\$ <b>1,217,009</b>	\$ <b>2,113,230</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Edic Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 27’	3	EA	\$ 41,332	\$ 123,995	\$ 41,774	\$ 125,322	\$ 83,106	\$ 249,317
2.2	Foundation – Drilled Pier – 8’X 29’	1	EA	\$ 44,372	\$ 44,372	\$ 44,847	\$ 44,847	\$ 89,219	\$ 89,219
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 168,366		\$ 170,169		\$ 338,536
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) – 105'	3	Structure	\$ 98,883	\$ 296,648	\$ 59,330	\$ 177,989	\$ 158,212	\$ 474,636
3.2	2-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 202,797	\$ 202,797	\$ 121,678	\$ 121,678	\$ 324,475	\$ 324,475
3.3	Install Grounding and Grounding Accessories	4	Pole	\$ 506	\$ 2,024	\$ 5,539	\$ 22,154	\$ 6,045	\$ 24,178
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES</b>					\$ 501,469		\$ 321,821		\$ 823,289
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 3.53	\$ -	\$ 5.00	\$ -	\$ 8.53	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.55	\$ -	\$ 5.00	\$ -	\$ 6.55	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.72	\$ -	\$ 5.00	\$ -	\$ 5.72	\$ -
4.5	Remove Existing Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)		Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)		Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)		Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	8	Assembly	\$ 250	\$ 2,000	\$ 150	\$ 1,200	\$ 400	\$ 3,200
5.7	OHSW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.8	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.10	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.11	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15									
5.16									
5.17									
5.18									
5.19	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 160,000		\$ 94,400		\$ 254,400
<b>L. Interconnection Edic Station</b>					\$ 829,835		\$ 954,240		\$ 1,784,075
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 76,918	\$ 76,918	\$ 76,918	\$ 76,918
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,841	\$ 17,841	\$ 17,841	\$ 17,841
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 89,204	\$ 89,204	\$ 89,204	\$ 89,204
6.6	LiDAR	-	LS	\$ -	\$ -	\$ 5,352	\$ -	\$ 5,352	\$ -
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,489	\$ 12,489	\$ 12,489	\$ 12,489
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,352	\$ 5,352	\$ 5,352	\$ 5,352
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 66,387	\$ 66,387	\$ -	\$ -	\$ 66,387	\$ 66,387
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 1,784	\$ 1,784	\$ 1,784	\$ 1,784
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 66,387		\$ 262,769		\$ 329,155

**ITC - T031 - (Segment A)**

**M. Interconnection New Scotland Station**

Estimate Revision: **5** Total: \$ 3,185,368

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>M. Interconnection New Scotland Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 367,850	\$ 367,850
2. FOUNDATIONS	\$ 365,657	\$ 473,093	\$ 838,749
3. STRUCTURES	\$ 655,465	\$ 445,628	\$ 1,101,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,555	\$ 26,100	\$ 29,655
5. INSULATORS, FITTINGS, HARDWARE	\$ 205,530	\$ 133,595	\$ 339,125
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 98,416	\$ 410,480	\$ 508,897
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,328,622</b>	<b>\$ 1,856,746</b>	<b>\$ 3,185,368</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,328,622</b>	<b>\$ 1,856,746</b>	<b>\$ 3,185,368</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection New Scotland Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	300.0	LF	\$ -	\$ -	\$ 70	\$ 21,000	\$ 70	\$ 21,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	20,000.0	SF	\$ -	\$ -	\$ 4	\$ 70,400	\$ 4	\$ 70,400
1.10	Restoration for Work Pad areas	4,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 600	\$ 0	\$ 600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 367,850		\$ 367,850
<b>2. FOUNDATIONS</b>									
2.1	Foundation – Drilled Pier – 8’X 50’	3	EA	\$ 76,500	\$ 229,501	\$ 77,320	\$ 231,959	\$ 153,820	\$ 461,459
2.2	Foundation – Drilled Pier – 8’X 89’	1	EA	\$ 136,156	\$ 136,156	\$ 137,614	\$ 137,614	\$ 273,770	\$ 273,770
2.3	Rock Excavation Adder	51.8	CY	\$ -	\$ -	\$ 2,000	\$ 103,520	\$ 2,000	\$ 103,520
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 365,657		\$ 473,093		\$ 838,749
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV 3-POLE MEDIUM ANGLE DEADEND (15°-60°) - 115'	3	Structure	\$ 178,026	\$ 534,077	\$ 106,815	\$ 320,446	\$ 284,841	\$ 854,522
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°) - 115'	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	Install Grounding and Grounding Accessories	10	Pole	\$ 506	\$ 5,060	\$ 5,539	\$ 55,385	\$ 6,045	\$ 60,445
3.4					\$ -		\$ -		
3.5									
3.6					\$ -		\$ -		
3.7					\$ -		\$ -		
3.8					\$ -		\$ -		
3.9					\$ -		\$ -		
3.10					\$ -		\$ -		
3.11					\$ -		\$ -		
3.12					\$ -		\$ -		
3.13					\$ -		\$ -		
3.14					\$ -		\$ -		
3.15					\$ -		\$ -		
<b>TOTAL - STRUCTURES</b>					\$ 655,465		\$ 445,628		\$ 1,101,092
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	1,500	LF	\$ 1.90	\$ 2,850	\$ 5.00	\$ 7,500	\$ 6.90	\$ 10,350
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	-	\$ 5.00	-	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	1,500	LF	\$ 0.47	\$ 705	\$ 5.00	\$ 7,500	\$ 5.47	\$ 8,205
4.5	Remove Existing 345kV Cable From Existing Structures	0.3	Mile	\$ -	\$ -	\$ 30,000	\$ 7,500	\$ 30,000.00	\$ 7,500
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	0.3	Mile	\$ -	\$ -	\$ 12,000	\$ 3,600	\$ 12,000.00	\$ 3,600
4.8									
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,555		\$ 26,100		\$ 29,655
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 2,540	\$ 152,400	\$ 1,350	\$ 81,000	\$ 3,890	\$ 233,400
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 1,270	\$ -	\$ 725	\$ -	\$ 1,995	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.7	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.9	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.10	Spacer - Conductor	9	EA	\$ 50	\$ 450	\$ 35	\$ 315	\$ 85	\$ 765
5.11	Vibration Dampers - Conductor	48	EA	\$ 35	\$ 1,680	\$ 35	\$ 1,680	\$ 70	\$ 3,360
5.12	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.13	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.14	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.15					\$ -		\$ -		\$ -
5.16	Interconnection Arrangements	1	EA	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19					\$ -		\$ -		\$ -
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 205,530		\$ 133,595		\$ 339,125
<b>M. Interconnection New Scotland Station</b>					\$ 1,230,206		\$ 1,446,265		\$ 2,676,471
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 26,765	\$ 26,765	\$ 26,765	\$ 26,765
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 115,392	\$ 115,392	\$ 115,392	\$ 115,392
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 26,765	\$ 26,765	\$ 26,765	\$ 26,765
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 26,765	\$ 26,765	\$ 26,765	\$ 26,765
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 133,824	\$ 133,824	\$ 133,824	\$ 133,824
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 8,029	\$ 8,029	\$ 8,029	\$ 8,029
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 18,735	\$ 18,735	\$ 18,735	\$ 18,735
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 8,029	\$ 8,029	\$ 8,029	\$ 8,029
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 98,416	\$ 98,416	\$ -	\$ -	\$ 98,416	\$ 98,416
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,676	\$ 2,676	\$ 2,676	\$ 2,676
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 98,416		\$ 410,480		\$ 508,897

**NAT & NYPA - T026 - (Segment A, Base)**

**N. Interconnection Rotterdam Station**

Estimate Revision: **5** Total: \$ **4,581,370**

NAT & NYPA - T026 - (Segment A, Base)			
	Supply	Installation	Total
<b>N. Interconnection Rotterdam Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,233,050	\$ 1,233,050
2. FOUNDATIONS	\$ 192,145	\$ 325,963	\$ 518,108
3. STRUCTURES	\$ 546,722	\$ 837,150	\$ 1,383,872
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 65,923	\$ 437,250	\$ 503,173
5. INSULATORS, FITTINGS, HARDWARE	\$ 165,730	\$ 118,480	\$ 284,210
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 77,642	\$ 581,316	\$ 658,957
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,533,209</b>	<b>\$ 4,581,370</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,048,161</b>	<b>\$ 3,533,209</b>	<b>\$ 4,581,370</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Rotterdam Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	7.0	Acre	\$ -	\$ -	\$ 15,000	\$ 105,000	\$ 15,000	\$ 105,000
1.2	Clearing the ROW - Light (mowing)	5.0	Acre	\$ -	\$ -	\$ 5,000	\$ 25,000	\$ 5,000	\$ 25,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	4,800.0	LF	\$ -	\$ -	\$ 4	\$ 19,200	\$ 4	\$ 19,200
1.5	Matting - Access and ROW	4,800.0	LF	\$ -	\$ -	\$ 70	\$ 336,000	\$ 70	\$ 336,000
1.6	Matting - To Work Area	2,400.0	LF	\$ -	\$ -	\$ 70	\$ 168,000	\$ 70	\$ 168,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	1.0	Mile	\$ -	\$ -	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
1.9	Work Pads	160,000.0	SF	\$ -	\$ -	\$ 4	\$ 563,200	\$ 4	\$ 563,200
1.10	Restoration for Work Pad areas	32,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 4,800	\$ 0	\$ 4,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 1,233,050		\$ 1,233,050
<b>2. FOUNDATIONS</b>									
2.1	10' ED Rock BF	6	EA	\$ 358	\$ 2,145	\$ 3,575	\$ 21,450	\$ 3,933	\$ 23,595
2.2	15' ED Rock BF	18	EA	\$ 536	\$ 9,653	\$ 5,363	\$ 96,525	\$ 5,899	\$ 106,178
2.3	20' ED Rock BF	4	EA	\$ 715	\$ 2,860	\$ 7,150	\$ 28,600	\$ 7,865	\$ 31,460
2.4	Foundation – Drilled Pier – 8'X 29'	4	EA	\$ 44,372	\$ 177,487	\$ 44,847	\$ 179,388	\$ 89,219	\$ 356,875
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 192,145		\$ 325,963		\$ 518,108
<b>3. STRUCTURES</b>									
3.1	15kv 3-CKT TANGENT DIST. - WOOD POLE	3	Pole	\$ 3,500	\$ 10,500	\$ 3,600	\$ 10,800	\$ 7,100	\$ 21,300
3.2	15kv 3-CKT MA DIST. - WOOD POLE	1	Pole	\$ 3,500	\$ 3,500	\$ 3,600	\$ 3,600	\$ 7,100	\$ 7,100
3.3	15kv 3-CKT DE - WOOD POLE	2	Pole	\$ 3,500	\$ 7,000	\$ 3,600	\$ 7,200	\$ 7,100	\$ 14,200
3.4	115kv 1-CKT TANGENT - WOOD POLE	5	Pole	\$ 4,500	\$ 22,500	\$ 4,400	\$ 22,000	\$ 8,900	\$ 44,500
3.5	115kv 1-CKT MA - WOOD POLE	2	Pole	\$ 4,500	\$ 9,000	\$ 4,400	\$ 8,800	\$ 8,900	\$ 17,800
3.6	115kv 1-CKT DE - WOOD POLE	11	Pole	\$ 5,500	\$ 60,500	\$ 5,000	\$ 55,000	\$ 10,500	\$ 115,500
3.7	115kv 2-CKT TANGENT - WOOD POLE	4	Pole	\$ 5,500	\$ 22,000	\$ 5,000	\$ 20,000	\$ 10,500	\$ 42,000
3.8	115kv 2-CKT DE - STEEL POLE	4	Pole	\$ 98,883	\$ 395,530	\$ 59,330	\$ 237,318	\$ 158,212	\$ 632,848
3.9	Remove Existing Structure	24	EA		\$ -	\$ 12,300	\$ 295,200	\$ 12,300	\$ 295,200
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12	Install Grounding and Grounding Accessories	32	Pole	\$ 506	\$ 16,192	\$ 5,539	\$ 177,232	\$ 6,045	\$ 193,424
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 546,722		\$ 837,150		\$ 1,383,872
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	23,400	LF	\$ 1.90	\$ 44,460	\$ 5.00	\$ 117,000	\$ 6.90	\$ 161,460
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	7,800	LF	\$ 0.47	\$ 3,666	\$ 5.00	\$ 39,000	\$ 5.47	\$ 42,666
4.5	Remove Existing Cable	6.6	Mile	\$ -	\$ -	\$ 30,000	\$ 197,700	\$ 30,000.00	\$ 197,700
4.6	Remove Existing EH7	2.2	Mile	\$ -	\$ -	\$ 12,000	\$ 26,400	\$ 12,000.00	\$ 26,400
4.7	15kv - (1) 477kcmil 26/7 ACSR "Hawk"	9,630	LF	\$ 1.62	\$ 15,601	\$ 5.00	\$ 48,150	\$ 6.62	\$ 63,751
4.8	15kv - (1) 336kcmil 26/7 ACSR "Linnet"	1,800	LF	\$ 1.22	\$ 2,196	\$ 5.00	\$ 9,000	\$ 6.22	\$ 11,196
4.9		-							
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 65,923		\$ 437,250		\$ 503,173
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	115kv Tangent (1-Group of 9-Bells Each Assembly)	33	Assembly	\$ 1,000	\$ 33,000	\$ 560	\$ 18,480	\$ 1,560	\$ 51,480
5.2	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	66	Assembly	\$ 1,000	\$ 66,000	\$ 560	\$ 36,960	\$ 1,560	\$ 102,960
5.3	15kv Tangent	12	Assembly	\$ 100	\$ 1,200	\$ 75	\$ 900	\$ 175	\$ 2,100
5.4	15kv Dead-end & Angle Insulators	18	Assembly	\$ 100	\$ 1,800	\$ 75	\$ 1,350	\$ 175	\$ 3,150
5.5	Neutral, Distribution, Tangent	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.6	Neutral, Distribution, DE/Side	2	Assembly	\$ 100	\$ 200	\$ 75	\$ 150	\$ 175	\$ 350
5.7	Jumper, DE/Angle, 3PH	4	Assembly	\$ 100	\$ 400	\$ 75	\$ 300	\$ 175	\$ 700
5.8	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OSHW Assembly - Tangent	11	Assembly	\$ 250	\$ 2,750	\$ 150	\$ 1,650	\$ 400	\$ 4,400
5.10	OHSW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.11	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.12	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.13	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.14	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.15	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.16	Guys, Anchors, and Accessories	14.0	EA	\$ 720	\$ 10,080	\$ 885	\$ 12,390	\$ 1,605	\$ 22,470
5.17	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.18					\$ -		\$ -		\$ -
5.19	Interconnection Arrangements	8	EA	\$ 5,000	\$ 40,000	\$ 5,000	\$ 40,000	\$ 10,000	\$ 80,000
5.20					\$ -		\$ -		\$ -
5.21					\$ -		\$ -		\$ -
5.22					\$ -		\$ -		\$ -
5.23					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 165,730		\$ 118,480		\$ 284,210
<b>N. Interconnection Rotterdam Station</b>					\$ 970,519		\$ 2,951,893		\$ 3,922,412
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 169,109	\$ 169,109	\$ 169,109	\$ 169,109
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 39,224	\$ 39,224	\$ 39,224	\$ 39,224
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 196,121	\$ 196,121	\$ 196,121	\$ 196,121
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 27,457	\$ 27,457	\$ 27,457	\$ 27,457
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 11,767	\$ 11,767	\$ 11,767	\$ 11,767
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 77,642	\$ 77,642	\$ -	\$ -	\$ 77,642	\$ 77,642
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 3,922	\$ 3,922	\$ 3,922	\$ 3,922
	<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>				\$ 77,642		\$ 581,316		\$ 658,957

**ITC - T031 - (Segment A)**

**Q. Princetown Switchyard - Install**

Estimate Revision: 5

Total: \$ 34,974,270

ITC - T031 - (Segment A)			
	Supply	Installation	Total
<b>Q. Princetown Switchyard - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 294,850	\$ 2,117,725	\$ 2,412,575
2. SUBSTATION FOUNDATIONS	\$ 2,731,032	\$ 2,787,932	\$ 5,518,964
3. SUBSTATION STRUCTURES	\$ 1,315,350	\$ 1,315,350	\$ 2,630,700
4. MAJOR EQUIPMENT	\$ 2,400,000	\$ 960,000	\$ 3,360,000
5. SMALL EQUIPMENT / MATERIALS	\$ 2,922,000	\$ 1,410,000	\$ 4,332,000
6. CONTROL HOUSE / PANELS	\$ 3,361,350	\$ 2,023,350	\$ 5,384,700
7. MISC ITEMS	\$ 1,492,750	\$ 2,842,330	\$ 4,335,080
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,161,387	\$ 5,838,865	\$ 7,000,251
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 15,678,719	\$ 19,295,552	\$ 34,974,270
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 15,678,719	\$ 19,295,552	\$ 34,974,270

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Q. Princetown Switchyard - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	8.13	ACRES	\$ -	\$ -	\$ 203,000	\$ 1,649,375	\$ 203,000	\$ 1,649,375
1.2	Station stone within substation fence.	2,000	CY	\$ 27	\$ 54,000	\$ 75	\$ 150,000	\$ 102	\$ 204,000
1.3	Substation Fence	2,300	LF	\$ 100	\$ 230,000	\$ 100	\$ 230,000	\$ 200	\$ 460,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide (Extend Existing)	310	LF	\$ 35	\$ 10,850	\$ 285	\$ 88,350	\$ 320	\$ 99,200
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 294,850		\$ 2,117,725		\$ 2,412,575
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 765kV</b>									
2.1a	Circuit Breaker Foundations		EA.	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)		EA.	\$ 52,290	\$ -	\$ 56,000	\$ -	\$ 108,290	\$ -
2.1e	Switch Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 1ph Foundations (High Bus)		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations (Low Bus)		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1j	Instrument Transformer Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1k	Arrester Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1m	Wave Trap Stand Foundations		EA.	\$ 8,964	\$ -	\$ 8,964	\$ -	\$ 17,928	\$ -
2.1n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 345kV</b>									
2.2a	Circuit Breaker Foundations	12	EA.	\$ 14,940	\$ 179,280	\$ 14,940	\$ 179,280	\$ 29,880	\$ 358,560
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	32	EA.	\$ 26,145	\$ 836,640	\$ 26,145	\$ 836,640	\$ 52,290	\$ 1,673,280
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA.	\$ 26,145	\$ -	\$ 26,145	\$ -	\$ 52,290	\$ -
2.2e	Switch Stand Foundations	144	EA.	\$ 4,482	\$ 645,408	\$ 4,482	\$ 645,408	\$ 8,964	\$ 1,290,816
2.2f	Station Service Transformer Stand Foundation	6	EA.	\$ 4,482	\$ 26,892	\$ 4,482	\$ 26,892	\$ 8,964	\$ 53,784
2.2g	Bus Support 1ph Foundations (High Bus)	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations (Low Bus)	86	EA.	\$ 4,482	\$ 385,452	\$ 4,482	\$ 385,452	\$ 8,964	\$ 770,904
2.2j	Instrument Transformer Stand Foundations	78	EA.	\$ 4,482	\$ 349,596	\$ 4,482	\$ 349,596	\$ 8,964	\$ 699,192
2.2k	Arrester Stand Foundations	24	EA.	\$ 4,482	\$ 107,568	\$ 4,482	\$ 107,568	\$ 8,964	\$ 215,136
2.2m	Wave Trap Stand Foundations	8	EA.	\$ 4,482	\$ 35,856	\$ 4,482	\$ 35,856	\$ 8,964	\$ 71,712
2.2n	Misc. Structure Foundations		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	765-345kV Transformer Foundation w/ Oil Containment	0	EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	765-345kV Transformer Fire Wall	0	EA.	\$ 106,074	\$ -	\$ 113,600	\$ -	\$ 219,674	\$ -
2.4c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad / Generator / Station Service Distribution Line</b>								
2.5a	Control House / Pad - 35' x 95'	1	EA	\$ 100,845	\$ 100,845	\$ 108,000	\$ 108,000	\$ 208,845	\$ 208,845
2.5b	Generator Foundation	1	EA	\$ 16,434	\$ 16,434	\$ 17,600	\$ 17,600	\$ 34,034	\$ 34,034
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 45,240	\$ 45,240	\$ 45,240	\$ 45,240
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	9	EA	\$ 5,229	\$ 47,061	\$ 5,600	\$ 50,400	\$ 10,829	\$ 97,461
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 2,731,032		\$ 2,787,932		\$ 5,518,964
<b>3.</b>	<b>SUBSTATION STRUCTURES</b>								
<b>3.1</b>	<b>765kV</b>								
3.1a	Substation A-Frame Structures - Stand alone		EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column		EA.	\$ 111,000	\$ -	\$ 111,000	\$ -	\$ 222,000	\$ -
3.1c	Switch Stands		EA.	\$ 22,200	\$ -	\$ 22,200	\$ -	\$ 44,400	\$ -
3.1d	Station Service Transformer Stand		EA.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 1ph (High Bus)		EA.	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1f	Bus Support 1 Ph (low Bus)		EA.	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.1g	Instrument Transformer Stand		EA.	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1h	Arrester Stand		EA.	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1j	Wave Trap Stand		EA.	\$ 9,250	\$ -	\$ 9,250	\$ -	\$ 18,500	\$ -
3.1k	Lightning Mast		EA.	\$ 9,250	\$ -	\$ 9,250	\$ -	\$ 18,500	\$ -
<b>3.2</b>	<b>345kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	8	EA	\$ 37,000	\$ 296,000	\$ 37,000	\$ 296,000	\$ 74,000	\$ 592,000
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.2c	Switch Stands	24	EA	\$ 14,800	\$ 355,200	\$ 14,800	\$ 355,200	\$ 29,600	\$ 710,400
3.2d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.2e	Bus Support 3ph	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2f	Bus Support 1 Ph	86	EA	\$ 3,700	\$ 318,200	\$ 3,700	\$ 318,200	\$ 7,400	\$ 636,400

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2g	Instrument Transformer Stand	78	EA	\$ 1,850	\$ 144,300	\$ 1,850	\$ 144,300	\$ 3,700	\$ 288,600
3.2h	Arrester Stand	24	EA	\$ 1,850	\$ 44,400	\$ 1,850	\$ 44,400	\$ 3,700	\$ 88,800
3.2i	Wave Trap Stand	8	EA	\$ 7,400	\$ 59,200	\$ 7,400	\$ 59,200	\$ 14,800	\$ 118,400
3.2j	Lightning Mast	9	EA	\$ 9,250	\$ 83,250	\$ 9,250	\$ 83,250	\$ 18,500	\$ 166,500
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 1,315,350		\$ 1,315,350		\$ 2,630,700
<b>4. MAJOR EQUIPMENT</b>									
<b>4.2</b>	<b>345kV</b>								
4.2a	Circuit Breakers	12	EA	\$ 200,000	\$ 2,400,000	\$ 80,000	\$ 960,000	\$ 280,000	\$ 3,360,000
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 60,000	\$ -	\$ 175,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 2,400,000		\$ 960,000		\$ 3,360,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.2</b>	<b>345kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	8	EA	\$ 40,000	\$ 320,000	\$ 15,000	\$ 120,000	\$ 55,000	\$ 440,000
5.2b	Disconnect Switches - 3ph w/ manual operator	24	EA	\$ 35,000	\$ 840,000	\$ 17,500	\$ 420,000	\$ 52,500	\$ 1,260,000
5.2c	VT'S	24	EA	\$ 25,000	\$ 600,000	\$ 12,000	\$ 288,000	\$ 37,000	\$ 888,000
5.2d	CT'S	24	EA	\$ 13,000	\$ 312,000	\$ 8,000	\$ 192,000	\$ 21,000	\$ 504,000
5.2e	CCVT'S	30	EA	\$ 13,000	\$ 390,000	\$ 8,000	\$ 240,000	\$ 21,000	\$ 630,000
5.2f	Arresters	24	EA	\$ 6,500	\$ 156,000	\$ 1,500	\$ 36,000	\$ 8,000	\$ 192,000
5.2g	Wave Traps	8	EA	\$ 13,000	\$ 104,000	\$ 8,000	\$ 64,000	\$ 21,000	\$ 168,000
5.2h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 28,000	\$ -	\$ 15,000	\$ -	\$ 43,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 33,000	\$ -	\$ 17,500	\$ -	\$ 50,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 2,922,000		\$ 1,410,000		\$ 4,332,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 526,500	\$ 526,500	\$ 81,000	\$ 81,000	\$ 607,500	\$ 607,500
6.2	Protection and Telecom Equipment Panels	38	EA	\$ 35,000	\$ 1,330,000	\$ 10,000	\$ 380,000	\$ 45,000	\$ 1,710,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 1,004,850	\$ 1,004,850	\$ 1,004,850	\$ 1,004,850	\$ 2,009,700	\$ 2,009,700
6.5	SCADA and Communications	1	EA	\$ 35,000	\$ 35,000	\$ 12,500	\$ 12,500	\$ 47,500	\$ 47,500
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 3,361,350		\$ 2,023,350		\$ 5,384,700
<b>7. MISC ITEMS 765kV</b>									
7.1	Conduit & Cable Trench System		LF	\$ 185.00	\$ -	\$ 231.27	\$ -	\$ 416.27	\$ -
7.2	Rigid Bus, Fittings & Insulators		LF	\$ 515.95	\$ -	\$ 237.10	\$ -	\$ 753.05	\$ -
7.3	Strain Bus, Connectors & Insulators		LF	\$ 61.50	\$ -	\$ 78.69	\$ -	\$ 140.19	\$ -
7.4	Grounding System		LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 39.51	\$ -
7.5	Strain Bus Insulators		EA	\$ 4,000	\$ -	\$ 2,100	\$ -	\$ 6,100	\$ -
7.6	Control Cables		LS	\$ 546,700	\$ -	\$ 546,700	\$ -	\$ 1,093,400	\$ -
7.7	Control Conduits from Trench to Equipment		LS	\$ 125,000	\$ -	\$ 125,000	\$ -	\$ 250,000	\$ -
7.8	Misc. Materials (Above and Below Ground)		LS	\$ 180,000	\$ -	\$ 180,000	\$ -	\$ 360,000	\$ -
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
<b>7. MISC ITEMS 345kV</b>									
7.15	Conduit & Cable Trench System	2,500	LF	\$ 125.07	\$ 312,675	\$ 170.00	\$ 425,000	\$ 295	\$ 737,675
7.16	Rigid Bus, Fittings & Insulators	3,500	LF	\$ 125.07	\$ 437,745	\$ 237.10	\$ 829,850	\$ 362	\$ 1,267,595
7.17	Strain Bus, Connectors & Insulators	0	LF	\$ 61.50	\$ -	\$ 78.69	\$ -	\$ 140	\$ -
7.18	Grounding System	31,000	LF	\$ 6.93	\$ 214,830	\$ 32.58	\$ 1,009,980	\$ 40	\$ 1,224,810
7.19	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.20	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.21	SSVT Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.22	Control Conduits from Trench to Equipment	1	LS	\$ 247,500	\$ 247,500	\$ 247,500	\$ 247,500	\$ 495,000	\$ 495,000
7.23	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.24									
7.25									
7.26									
7.27									
7.28									
7.29									
<b>TOTAL - MISC ITEMS</b>					\$ 1,492,750		\$ 2,842,330		\$ 4,335,080
<b>Q. Princetown Switchyard - Install</b>					\$ 14,517,332		\$ 13,456,687		\$ 27,974,019
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 279,740	\$ 279,740	\$ 279,740	\$ 279,740
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,206,058	\$ 1,206,058	\$ 1,206,058	\$ 1,206,058
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 279,740	\$ 279,740	\$ 279,740	\$ 279,740
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 279,740	\$ 279,740	\$ 279,740	\$ 279,740
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,237,922	\$ 2,237,922	\$ 2,237,922	\$ 2,237,922
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 195,818	\$ 195,818	\$ 195,818	\$ 195,818
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 699,350	\$ 699,350	\$ 699,350	\$ 699,350
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 83,922	\$ 83,922	\$ 83,922	\$ 83,922
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 534,600	\$ 534,600	\$ 534,600	\$ 534,600

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,161,387	\$ 1,161,387	\$ -	\$ -	\$ 1,161,387	\$ 1,161,387
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 27,974	\$ 27,974	\$ 27,974	\$ 27,974
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,161,387		\$ 5,838,865		\$ 7,000,251

**ITC - T031 - (Segment A)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 3.698% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.



National Grid and NY Transco (T019)			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$34,641
	1.2	Foundations	\$44,405
	1.3	Structures	\$56,279
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$30,070
	1.5	Insulators, Fitting and Hardwares	\$11,200
	Subtotal (1)		<b>\$176,595</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$26,306
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$2,226
	2.4	Churchtown Substation	\$14,616
	2.5	Pleasant Valley Substation	\$6,939
	2.6	Substation Interconnections	\$5,534
Subtotal (2)		<b>\$55,682</b>	
Total (1+2)		\$232,277	
Contractors Mark-up (15% of Total 1+2)		\$34,842	
Total Direct Cost (A)		<b>\$267,118</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,323
	3.2	Project Management, Material Handling & Amenities	\$16,172
	3.3	Engineering	\$15,527
	3.4	Testing & Commissioning	\$1,324
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$16,982
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,428
	Total Indirect Cost (3)		<b>\$59,755</b>
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$326,874</b>	
4	<b>Network Upgrade Facilities (NUF)</b>		
	4.1	NUF proposed as element of the Project (Fishkill and New Scotland Terminals)	\$1,085
	4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000
Subtotal NUF Cost (C)		<b>\$31,085</b>	
Total Project Cost (B+C) 2017 \$		<b>\$357,959</b>	
Total Project Cost 2018 \$		<b>\$368,698</b>	

**NG & NY Transco - T019 - (Segment B)**

Estimate Revision: 8

<i>NG &amp; NY Transco - T019 - (Segment B)</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 70,736,799
Direct Labor, Material & Equipment Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 101,111,607
Direct Labor, Material & Equipment Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 4,746,361
Direct Labor, Material & Equipment Costs	D. Knickerbocker 345kV Substation - Install	\$ 26,306,261
Direct Labor, Material & Equipment Costs	E. Greenbush Substation - Removal	\$ 61,200
Direct Labor, Material & Equipment Costs	F. Schodack Substation - Install	\$ 2,089,357
Direct Labor, Material & Equipment Costs	G. Schodack Substation - Removal	\$ 136,200
Direct Labor, Material & Equipment Costs	H. Churchtown Substation - Install	\$ 13,652,332
Direct Labor, Material & Equipment Costs	I. Churchtown Substation - Removal	\$ 963,678
Direct Labor, Material & Equipment Costs	J. Pleasant Valley Substation - Install	\$ 6,898,903
Direct Labor, Material & Equipment Costs	K. Pleasant Valley Substation - Removal	\$ 40,500
Direct Labor, Material & Equipment Costs	L. Interconnection Knickerbocker Station	\$ 3,068,229
Direct Labor, Material & Equipment Costs	M. Interconnection Churchtown Station	\$ 1,881,925
Direct Labor, Material & Equipment Costs	N. Interconnection Milan Station	\$ 583,388
Direct Labor, Material & Equipment Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 21,428,571
Direct Labor, Material & Equipment Costs	P. NUF proposed as element of the Project (Fishkill and New Scotland Terminals)	\$ 774,000
<b>SUBTOTAL:</b>		\$ 254,479,311
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		\$ 38,171,897
<b>CONTINGENCY ON ENTIRE PROJECT</b>		\$ -
<b>TOTAL DIRECT:</b>		\$ 292,651,208

<i>NG &amp; NY Transco - T019 - (Segment B)</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 15,568,288
Indirect Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 22,500,395
Indirect Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 943,735
Indirect Costs	D. Knickerbocker 345kV Substation - Install	\$ 6,607,256
Indirect Costs	E. Greenbush Substation - Removal	\$ 9,952
Indirect Costs	F. Schodack Substation - Install	\$ 490,500
Indirect Costs	G. Schodack Substation - Removal	\$ 22,149
Indirect Costs	H. Churchtown Substation - Install	\$ 3,282,774
Indirect Costs	I. Churchtown Substation - Removal	\$ 156,716
Indirect Costs	J. Pleasant Valley Substation - Install	\$ 1,753,769
Indirect Costs	K. Pleasant Valley Substation - Removal	\$ 7,477
Indirect Costs	L. Interconnection Knickerbocker Station	\$ 559,427
Indirect Costs	M. Interconnection Churchtown Station	\$ 319,787
Indirect Costs	N. Interconnection Milan Station	\$ 105,632
Indirect Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 5,357,143
Indirect Costs	P. NUF proposed as element of the Project (Fishkill and New Scotland Terminals)	\$ 195,000
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lisc. & Permit., and Envir. Mitigation)	\$ 7,427,609
<b>TOTAL INDIRECT :</b>		\$ 65,307,611
<b>TOTAL ESTIMATED COST :</b>		\$ 357,958,819

**NG & NY Transco - T019 - (Segment B)**

**A. Transmission Line Knickerbocker to Churchtown**

Estimate Revision: **8** Total: \$ **86,305,087**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>A. Transmission Line Knickerbocker to Churchtown</b>			
1. CLEARING & ACCESS	\$ 11,500	\$ 13,799,703	\$ 13,811,203
2. FOUNDATIONS	\$ 9,710,029	\$ 10,978,019	\$ 20,688,047
3. STRUCTURES	\$ 9,422,041	\$ 10,929,158	\$ 20,351,199
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,367,420	\$ 8,759,465	\$ 11,126,885
5. INSULATORS, FITTINGS, HARDWARE	\$ 3,150,161	\$ 1,609,303	\$ 4,759,465
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,972,892	\$ 13,595,396	\$ 15,568,288
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 26,634,043	\$ 59,671,044	\$ 86,305,087
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 26,634,043	\$ 59,671,044	\$ 86,305,087

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Knickerbocker to Churchtown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	23.0	Acre	\$ -	\$ -	\$ 15,000	\$ 345,000	\$ 15,000	\$ 345,000
1.2	Clearing the ROW - Light (mowing)	63.0	Acre		\$ -	\$ 5,000	\$ 315,000	\$ 5,000	\$ 315,000
1.3	Access Road	23,126	LF	\$ -	\$ -	\$ 45.00	\$ 1,040,688	\$ 45	\$ 1,040,688
1.4	Silt Fence	115,632	LF	\$ -	\$ -	\$ 4.00	\$ 462,528	\$ 4	\$ 462,528
1.5	Matting - Access and ROW	92,506	LF	\$ -	\$ -	\$ 70.00	\$ 6,475,392	\$ 70	\$ 6,475,392
1.6	Matting - To Work Area	16,575	LF	\$ -	\$ -	\$ 70.00	\$ 1,160,250	\$ 70	\$ 1,160,250
1.7	Snow Removal	21.9	Mile	\$ -	\$ -	\$ 16,000	\$ 350,400	\$ 16,000	\$ 350,400
1.8	ROW Restoration	21.9	Mile	\$ -	\$ -	\$ 10,000	\$ 219,000	\$ 10,000	\$ 219,000
1.9	Work Pads	850,000	SF	\$ -	\$ -	\$ 3.52	\$ 2,992,000	\$ 4	\$ 2,992,000
1.10	Restoration for Work Pad areas	170,000	SF	\$ -	\$ -	\$ 0.15	\$ 25,500	\$ 0	\$ 25,500
1.11	Temporary Access Bridge	9	EA	\$ -	\$ -	\$ 20,035	\$ 180,315	\$ 20,035	\$ 180,315
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	4	EA	\$ -	\$ -	\$ 4,580	\$ 18,320	\$ 4,580	\$ 18,320
1.14	Maintenance and Protection of Traffic on Public Roads	47	EA	\$ -	\$ -	\$ 4,130	\$ 194,110	\$ 4,130	\$ 194,110
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	2	EA	\$ 2,000	\$ 4,000	\$ 2,500	\$ 5,000	\$ 4,500	\$ 9,000
1.17	Concrete Washout Station	2	EA	\$ -	\$ -	\$ 1,850	\$ 3,700	\$ 1,850	\$ 3,700
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 11,500	\$ 13,799,703	\$ 13,811,203		
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115/345kV Double Ckt H- Pole Angle/DE	3	EA	\$ 133,937	\$ 401,811	\$ 135,372	\$ 406,115	\$ 269,309	\$ 807,926
2.2	Drilled Pier - 115/345kV Double Ckt Single Pole Angle/ DE	21	EA	\$ 156,123	\$ 3,278,583	\$ 157,795	\$ 3,313,695	\$ 313,918	\$ 6,592,278
2.3	Drilled Pier - 115/345kV Double Ckt Single Pole Tangent	133	EA	\$ 35,333	\$ 4,699,302	\$ 35,712	\$ 4,749,630	\$ 71,045	\$ 9,448,932
2.4	Drilled Pier - 115kV Single Circuit H-Pole Angle/ DE	2	EA	\$ 125,720	\$ 251,440	\$ 127,067	\$ 254,133	\$ 252,787	\$ 505,573
2.5	Drilled Pier - 115kV Single Circuit H-Pole Tangent	2	EA	\$ 81,348	\$ 162,697	\$ 82,220	\$ 164,439	\$ 163,568	\$ 327,136
2.6	Drilled Pier - 115kV Single Circuit Single Pole Angle/ DE	5	EA	\$ 78,062	\$ 390,308	\$ 78,898	\$ 394,488	\$ 156,959	\$ 784,795
2.7	Drilled Pier - 345kV Single Circuit Single Pole DE	4	EA	\$ 131,472	\$ 525,888	\$ 132,880	\$ 531,520	\$ 264,352	\$ 1,057,408
2.8	Rock Excavation Adder	582	CY	\$ -	\$ -	\$ 2,000	\$ 1,164,000	\$ 2,000	\$ 1,164,000
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									
2.16									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.17									
2.18									
<b>TOTAL - FOUNDATIONS:</b>					\$ 9,710,029		\$ 10,978,019		\$ 20,688,047
<b>3. STRUCTURES</b>									
3.1	115/345kV Double Ckt H- Pole Angle/DE	3	Structure	\$ 99,985	\$ 299,955	\$ 59,991	\$ 179,973	\$ 159,976	\$ 479,928
3.2	115/345kV Double Ckt Single Pole Angle/ DE	21	Structure	\$ 112,378	\$ 2,359,943	\$ 67,427	\$ 1,415,966	\$ 179,805	\$ 3,775,909
3.3	115/345kV Double Ckt Single Pole Tangent	133	Structure	\$ 44,517	\$ 5,920,701	\$ 26,710	\$ 3,552,421	\$ 71,226	\$ 9,473,122
3.4	115kV Single Circuit H-Pole Angle/ DE	2	Structure	\$ 42,263	\$ 84,527	\$ 25,358	\$ 50,716	\$ 67,621	\$ 135,242
3.5	115kV Single Circuit H-Pole Tangent	2	Structure	\$ 39,442	\$ 78,884	\$ 23,665	\$ 47,330	\$ 63,107	\$ 126,214
3.6	115kV Single Circuit Single Pole Angle/ DE	5	Structure	\$ 52,041	\$ 260,203	\$ 31,224	\$ 156,122	\$ 83,265	\$ 416,324
3.7	345kV Single Circuit Single Pole DE	4	Structure	\$ 82,952	\$ 331,809	\$ 49,771	\$ 199,085	\$ 132,723	\$ 530,894
3.8									
3.9									
3.10									
3.11									
3.12	Remove Existing Foundation	688	EA	\$ -	\$ -	\$ 3,250	\$ 2,236,000	\$ 3,250	\$ 2,236,000
3.13	Remove Existing Structure and Accessories	172	EA	\$ -	\$ -	\$ 12,500	\$ 2,150,000	\$ 12,500	\$ 2,150,000
3.14	Install Grounding and Grounding Accessories	170	Pole	\$ 506	\$ 86,020	\$ 5,539	\$ 941,545	\$ 6,045	\$ 1,027,565
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 9,422,041		\$ 10,929,158		\$ 20,351,199
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	741,787	LF	\$ 1.90	\$ 1,409,395	\$ 5.00	\$ 3,708,935	\$ 6.90	\$ 5,118,330
4.2	(1) OPGW 36 Fiber AC-33/38/571	123,631	LF	\$ 1.35	\$ 166,902	\$ 5.00	\$ 618,155	\$ 6.35	\$ 785,057
4.3	(1) 3/8" EHS7 Steel	121,414	LF	\$ 0.47	\$ 57,065	\$ 5.00	\$ 607,070	\$ 5.47	\$ 664,135
4.4	Remove Existing Cable From Existing Structures	43.8	Mile	\$ -	\$ -	\$ 30,000	\$ 1,314,000	\$ 30,000.00	\$ 1,314,000
4.5	Remove Existing OPGW Cable and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.6	Remove Existing OHSW and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.7	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	364,241	LF	\$ 1.90	\$ 692,058	\$ 5.00	\$ 1,821,205	\$ 6.90	\$ 2,513,263
4.8	Rider Poles (47 Locations)	24	Set	\$ 1,750	\$ 42,000	\$ 3,500	\$ 84,000	\$ 5,250.00	\$ 126,000
4.9	Rider Poles - Relocated	23	Set	\$ -	\$ -	\$ 3,500	\$ 80,500	\$ 3,500.00	\$ 80,500
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,367,420		\$ 8,759,465		\$ 11,126,885
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	665	Assembly	\$ 1,800	\$ 1,197,000	\$ 720	\$ 478,800	\$ 2,520	\$ 1,675,800
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	671	Assembly	\$ 900	\$ 603,900	\$ 560	\$ 375,760	\$ 1,460	\$ 979,660
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	420	Assembly	\$ 1,800	\$ 756,000	\$ 720	\$ 302,400	\$ 2,520	\$ 1,058,400
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	217	Assembly	\$ 900	\$ 195,300	\$ 560	\$ 121,520	\$ 1,460	\$ 316,820
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	135	Assembly	\$ 200	\$ 27,000	\$ 150	\$ 20,250	\$ 350	\$ 47,250
5.7	OPGW Assembly - Angle / DE	62	Assembly	\$ 250	\$ 15,500	\$ 150	\$ 9,300	\$ 400	\$ 24,800
5.8	OHSW Assembly - Tangent	135	Assembly	\$ 200	\$ 27,000	\$ 150	\$ 20,250	\$ 350	\$ 47,250
5.9	OHSW Assembly - Angle / DE	56	Assembly	\$ 250	\$ 14,000	\$ 150	\$ 8,400	\$ 400	\$ 22,400
5.10	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.11	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.12	Spacer - Conductor	3,651	EA	\$ 50	\$ 182,550	\$ 35	\$ 127,785	\$ 85	\$ 310,335
5.13	Vibration Dampers - Conductor	1,971	EA	\$ 35	\$ 68,985	\$ 35	\$ 68,985	\$ 70	\$ 137,970
5.14	Shield wire / OPGW Dampers, Misc. Fittings	442	EA	\$ 27	\$ 11,934	\$ 35	\$ 15,470	\$ 62	\$ 27,404

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	22	Mile	\$ 770	\$ 16,863	\$ 1,006	\$ 22,031	\$ 1,776	\$ 38,894
5.17		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 3,150,161		\$ 1,609,303		\$ 4,759,465
<b>A. Transmission Line Knickerbocker to Churchtown</b>					\$ 24,661,151		\$ 46,075,648		\$ 70,736,799
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 707,368	\$ 707,368	\$ 707,368	\$ 707,368
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,510,137	\$ 3,510,137	\$ 3,510,137	\$ 3,510,137
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 707,368	\$ 707,368	\$ 707,368	\$ 707,368
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 707,368	\$ 707,368	\$ 707,368	\$ 707,368
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,536,840	\$ 3,536,840	\$ 3,536,840	\$ 3,536,840
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 212,210	\$ 212,210	\$ 212,210	\$ 212,210
6.7	Geotech	22	Location	\$ -	\$ -	\$ 3,500	\$ 77,000	\$ 3,500	\$ 77,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 495,158	\$ 495,158	\$ 495,158	\$ 495,158
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 212,210	\$ 212,210	\$ 212,210	\$ 212,210
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 3,319,000	\$ 3,319,000	\$ 3,319,000	\$ 3,319,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,972,892	\$ 1,972,892	\$ -	\$ -	\$ 1,972,892	\$ 1,972,892
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 70,737	\$ 70,737	\$ 70,737	\$ 70,737
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,972,892		\$ 13,595,396		\$ 15,568,288

**NG & NY Transco - T019 - (Segment B)**

**B. Transmission Line Churchtown to Pleasant Valley**

Estimate Revision: **8** Total: \$ **123,612,003**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>B. Transmission Line Churchtown to Pleasant Valley</b>			
1. CLEARING & ACCESS	\$ 14,000	\$ 19,410,966	\$ 19,424,966
2. FOUNDATIONS	\$ 5,416,314	\$ 17,138,320	\$ 22,554,633
3. STRUCTURES	\$ 12,430,954	\$ 21,953,334	\$ 34,384,288
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,505,234	\$ 14,965,685	\$ 18,470,919
5. INSULATORS, FITTINGS, HARDWARE	\$ 4,145,919	\$ 2,130,882	\$ 6,276,801
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,040,994	\$ 20,459,402	\$ 22,500,395
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 27,553,414</b>	<b>\$ 96,058,589</b>	<b>\$ 123,612,003</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 27,553,414</b>	<b>\$ 96,058,589</b>	<b>\$ 123,612,003</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Churchtown to Pleasant Valley</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	17.0	Acre	\$ -	\$ -	\$ 15,000	\$ 255,000	\$ 15,000	\$ 255,000
1.2	Clearing the ROW - Light (mowing)	116.0	Acre	\$ -	\$ -	\$ 5,000	\$ 580,000	\$ 5,000	\$ 580,000
1.3	Access Road	34,109	LF	\$ -	\$ -	\$ 45	\$ 1,534,896	\$ 45	\$ 1,534,896
1.4	Silt Fence	170,544.0	LF	\$ -	\$ -	\$ 4	\$ 682,176	\$ 4	\$ 682,176
1.5	Matting - Access and ROW	136,435	LF	\$ -	\$ -	\$ 70	\$ 9,550,464	\$ 70	\$ 9,550,464
1.6	Matting - To Work Area	16,275.0	LF	\$ -	\$ -	\$ 70	\$ 1,139,250	\$ 70	\$ 1,139,250
1.7	Snow Removal	32.3	Mile	\$ -	\$ -	\$ 16,000	\$ 516,800	\$ 16,000	\$ 516,800
1.8	ROW Restoration	32.3	Mile	\$ -	\$ -	\$ 10,000	\$ 323,000	\$ 10,000	\$ 323,000
1.9	Work Pads	1,155,000.0	SF	\$ -	\$ -	\$ 4	\$ 4,065,600	\$ 4	\$ 4,065,600
1.10	Restoration for Work Pad areas	231,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 34,650	\$ 0	\$ 34,650
1.11	Temporary Access Bridge	14	EA	\$ -	\$ -	\$ 20,035	\$ 280,490	\$ 20,035	\$ 280,490
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	12	EA	\$ -	\$ -	\$ 4,580	\$ 54,960	\$ 4,580	\$ 54,960
1.14	Maintenance and Protection of Traffic on Public Roads	86	EA	\$ -	\$ -	\$ 4,130	\$ 355,180	\$ 4,130	\$ 355,180
1.15	Gates	4	EA	\$ 2,000	\$ 8,000	\$ 2,500	\$ 10,000	\$ 4,500	\$ 18,000
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 14,000		\$ 19,410,966		\$ 19,424,966
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115/345kV Double Ckt Single Pole Angle/ DE	25	EA	\$ 52,589	\$ 1,314,720	\$ 53,152	\$ 1,328,800	\$ 105,741	\$ 2,643,520
2.2	Drilled Pier - 115/345kV Double Ckt Single Pole Tangent	202	EA	\$ 19,349	\$ 3,908,494	\$ 19,556	\$ 3,950,352	\$ 38,905	\$ 7,858,846
2.3	Drilled Pier - 115kV Single Circuit Single Pole Angle/ DE	3	EA	\$ 46,837	\$ 140,511	\$ 47,339	\$ 142,016	\$ 94,175	\$ 282,526
2.4	Drilled Pier - 345kV Single Circuit Single Pole DE	1	EA	\$ 52,589	\$ 52,589	\$ 53,152	\$ 53,152	\$ 105,741	\$ 105,741
2.5	Rock Excavation Adder	5,832.0	CY	\$ -	\$ -	\$ 2,000	\$ 11,664,000	\$ 2,000	\$ 11,664,000
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
<b>TOTAL - FOUNDATIONS:</b>					\$ 5,416,314		\$ 17,138,320		\$ 22,554,633
<b>3. STRUCTURES</b>									
3.1	115/345kV Double Ckt Single Pole Angle/ DE	25	Structure	\$ 115,090	\$ 2,877,259	\$ 69,054	\$ 1,726,355	\$ 184,145	\$ 4,603,614
3.2	115/345kV Double Ckt Single Pole Tangent	202	Structure	\$ 45,131	\$ 9,116,367	\$ 27,078	\$ 5,469,820	\$ 72,209	\$ 14,586,187

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3	115kV Single Circuit Single Pole Angle/ DE	3	Structure	\$ 79,163	\$ 237,490	\$ 47,498	\$ 142,494	\$ 126,661	\$ 379,984
3.4	345kV Single Circuit Single Pole DE	1	Structure	\$ 82,952	\$ 82,952	\$ 49,771	\$ 49,771	\$ 132,723	\$ 132,723
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12	Remove Existing Foundation	2,084	EA	\$ -	\$ -	\$ 3,250	\$ 6,773,000	\$ 3,250	\$ 6,773,000
3.13	Remove Existing Structure and Accessories	521	EA	\$ -	\$ -	\$ 12,500	\$ 6,512,500	\$ 12,500	\$ 6,512,500
3.14									
3.15	Install Grounding and Grounding Accessories	231	Pole	\$ 506	\$ 116,886	\$ 5,539	\$ 1,279,394	\$ 6,045	\$ 1,396,280
3.16									
3.17									
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 12,430,954		\$ 21,953,334		\$ 34,384,288
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	1,087,733	LF	\$ 1.90	\$ 2,066,693	\$ 5.00	\$ 5,438,665	\$ 6.90	\$ 7,505,358
4.2	(1) OPGW 36 Fiber AC-33/38/571	181,289	LF	\$ 1.35	\$ 244,740	\$ 5.00	\$ 906,445	\$ 6.35	\$ 1,151,185
4.3	(1) 3/8" EHS7 Steel	181,289	LF	\$ 0.47	\$ 85,206	\$ 5.00	\$ 906,445	\$ 5.47	\$ 991,651
4.5	Remove Existing 115kV Cable From Existing Structures	130.4	Mile	\$ -	\$ -	\$ 30,000	\$ 3,912,000	\$ 30,000.00	\$ 3,912,000
4.6	Remove Existing OPGW Cable and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.7	Remove Existing OHSW and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 391,200	\$ 12,000.00	\$ 391,200
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	543,866	LF	\$ 1.90	\$ 1,033,345	\$ 5.00	\$ 2,719,330	\$ 6.90	\$ 3,752,675
4.9									
4.10	Rider Poles - Relocated	43	Set	\$ -	\$ -	\$ 3,500	\$ 150,500	\$ 3,500.00	\$ 150,500
4.11	Rider Poles (86 Total)	43	EA	\$ 1,750	\$ 75,250	\$ 3,500	\$ 150,500	\$ 5,250.00	\$ 225,750
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,505,234		\$ 14,965,685		\$ 18,470,919
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,010	Assembly	\$ 1,800	\$ 1,818,000	\$ 720	\$ 727,200	\$ 2,520	\$ 2,545,200
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	1,010	Assembly	\$ 900	\$ 909,000	\$ 560	\$ 565,600	\$ 1,460	\$ 1,474,600
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	390	Assembly	\$ 1,800	\$ 702,000	\$ 720	\$ 280,800	\$ 2,520	\$ 982,800
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	196	Assembly	\$ 900	\$ 176,400	\$ 560	\$ 109,760	\$ 1,460	\$ 286,160
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	202	Assembly	\$ 200	\$ 40,400	\$ 150	\$ 30,300	\$ 350	\$ 70,700
5.7	OPGW Assembly - Angle / DE	52	Assembly	\$ 250	\$ 13,000	\$ 150	\$ 7,800	\$ 400	\$ 20,800
5.8	OHSW Assembly - Tangent	202	Assembly	\$ 200	\$ 40,400	\$ 150	\$ 30,300	\$ 350	\$ 70,700
5.9	OHSW Assembly - Angle / DE	56	Assembly	\$ 250	\$ 14,000	\$ 150	\$ 8,400	\$ 400	\$ 22,400
5.10	OPGW Splice Boxes	12	Set	\$ 1,746	\$ 20,954	\$ 2,274	\$ 27,288	\$ 4,020	\$ 48,242
5.11	OPGW Splice & Test	12	EA	\$ 2,520	\$ 30,240	\$ 2,520	\$ 30,240	\$ 5,040	\$ 60,480
5.12	Spacer - Conductor	5,414	EA	\$ 50	\$ 270,700	\$ 35	\$ 189,490	\$ 85	\$ 460,190
5.13	Vibration Dampers - Conductor	1,949	EA	\$ 35	\$ 68,215	\$ 35	\$ 68,215	\$ 70	\$ 136,430
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	657	EA	\$ 27	\$ 17,739	\$ 35	\$ 22,995	\$ 62	\$ 40,734
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	32.3	Mile	\$ 770	\$ 24,871	\$ 1,006	\$ 32,494	\$ 1,776	\$ 57,365
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 4,145,919		\$ 2,130,882		\$ 6,276,801
<b>B. Transmission Line Churchtown to Pleasant Valley</b>									
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,011,116	\$ 1,011,116	\$ 1,011,116	\$ 1,011,116
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 5,017,411	\$ 5,017,411	\$ 5,017,411	\$ 5,017,411
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,011,116	\$ 1,011,116	\$ 1,011,116	\$ 1,011,116

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,011,116	\$ 1,011,116	\$ 1,011,116	\$ 1,011,116
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,055,580	\$ 5,055,580	\$ 5,055,580	\$ 5,055,580
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 303,335	\$ 303,335	\$ 303,335	\$ 303,335
6.7	Geotech	33.0	Location	\$ -	\$ -	\$ 3,500	\$ 115,500	\$ 3,500	\$ 115,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 707,781	\$ 707,781	\$ 707,781	\$ 707,781
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 303,335	\$ 303,335	\$ 303,335	\$ 303,335
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 5,782,000	\$ 5,782,000	\$ 5,782,000	\$ 5,782,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 2,040,994	\$ 2,040,994	\$ -	\$ -	\$ 2,040,994	\$ 2,040,994
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 101,112	\$ 101,112	\$ 101,112	\$ 101,112
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,040,994	\$ 101,112	\$ 20,459,402	\$ 22,500,395	\$ 22,500,395

**NG & NY Transco - T019 - (Segment B)**

**C. Blue Stores Junction to Blue Stores Substation**

Estimate Revision: **8**

Total: \$ **5,690,096**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>C. Blue Stores Junction to Blue Stores Substation</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,404,512	\$ 1,404,512
2. FOUNDATIONS	\$ 236,848	\$ 925,954	\$ 1,162,802
3. STRUCTURES	\$ 596,484	\$ 946,665	\$ 1,543,149
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 84,763	\$ 387,095	\$ 471,858
5. INSULATORS, FITTINGS, HARDWARE	\$ 107,544	\$ 56,496	\$ 164,040
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 82,051	\$ 861,684	\$ 943,735
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
SUBTOTAL:	\$ 1,107,690	\$ 4,582,406	\$ 5,690,096
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
TOTAL:	\$ 1,107,690	\$ 4,582,406	\$ 5,690,096

0.0%

0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	4.0	Acre	\$ -	\$ -	\$ 5,000	\$ 20,000	\$ 5,000	\$ 20,000
1.3	Access Road	2,218	LF	\$ -	\$ -	\$ 45	\$ 99,792	\$ 45	\$ 99,792
1.4	Silt Fence	11,088.0	LF	\$ -	\$ -	\$ 4	\$ 44,352	\$ 4	\$ 44,352
1.5	Matting - Access and ROW	8,870	LF	\$ -	\$ -	\$ 70	\$ 620,928	\$ 70	\$ 620,928
1.6	Matting - To Work Area	1,800.0	LF	\$ -	\$ -	\$ 70	\$ 126,000	\$ 70	\$ 126,000
1.7	Snow Removal	2.1	Mile	\$ -	\$ -	\$ 16,000	\$ 33,600	\$ 16,000	\$ 33,600
1.8	ROW Restoration	2.1	Mile	\$ -	\$ -	\$ 10,000	\$ 21,000	\$ 10,000	\$ 21,000
1.9	Work Pads	120,000.0	SF	\$ -	\$ -	\$ 4	\$ 422,400	\$ 4	\$ 422,400
1.10	Restoration for Work Pad areas	24,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 3,600	\$ 0	\$ 3,600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	1	EA	\$ -	\$ -	\$ 4,580	\$ 4,580	\$ 4,580	\$ 4,580
1.14	Maintenance and Protection of Traffic on Public Roads	2	EA	\$ -	\$ -	\$ 4,130	\$ 8,260	\$ 4,130	\$ 8,260
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	-	EA	\$ -	\$ -	\$ 1,850	\$ -	\$ 1,850	\$ -
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ -		\$ 1,404,512		\$ 1,404,512
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	6	EA	\$ 31,225	\$ 187,348	\$ 31,559	\$ 189,354	\$ 62,784	\$ 376,702
2.2	Direct Embed - 115kV Single Circuit H- Pole Tangent	18	EA	\$ 2,750	\$ 49,500	\$ 18,700	\$ 336,600	\$ 21,450	\$ 386,100
2.3	Rock Excavation Adder	200.0	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 236,848		\$ 925,954		\$ 1,162,802
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit H- Pole Angle/ DE	6	Structure	\$ 39,822	\$ 238,929	\$ 23,893	\$ 143,358	\$ 63,714	\$ 382,287
3.2	115kV Single Circuit H- Pole Tangent	18	Structure	\$ 18,515	\$ 333,266	\$ 11,109	\$ 199,960	\$ 29,624	\$ 533,226
3.3	Remove Existing Foundation	-	EA	\$ -	\$ -	\$ 7,500	\$ -	\$ 7,500	\$ -
3.4	Remove Existing Structure and Accessories	27	EA	\$ -	\$ -	\$ 12,500	\$ 337,500	\$ 12,500	\$ 337,500
3.5									
3.6	Install Grounding and Grounding Accessories	48	Pole	\$ 506	\$ 24,288	\$ 5,539	\$ 265,848	\$ 6,045	\$ 290,136
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 596,484		\$ 946,665		\$ 1,543,149
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.4	115kV - (1) 795kcmil 26/7 ACSR "Drake"	34,927.0	LF	\$ 1.72	\$ 60,074	\$ 5.00	\$ 174,635	\$ 6.72	\$ 234,709
4.5	(1) OPGW 36 Fiber AC-33/38/571	11,642.0	LF	\$ 1.35	\$ 15,717	\$ 5.00	\$ 58,210	\$ 6.35	\$ 73,927
4.6	(1) 3/8" EHS7 Steel	11,642.0	LF	\$ 0.47	\$ 5,472	\$ 5.00	\$ 58,210	\$ 5.47	\$ 63,682
4.7	Remove Existing Cable	2.1	Mile	\$ -	\$ -	\$ 30,000	\$ 63,600	\$ 30,000.00	\$ 63,600
4.8	Remove Existing OPGW Cable and Accessories	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.9	Remove Existing OHSW and Accessories	2.1	Mile	\$ -	\$ -	\$ 12,000	\$ 25,440	\$ 12,000.00	\$ 25,440
4.10		-							
4.11		-							
4.12	Rider Poles (Locations)	2.0	EA	\$ 1,750	\$ 3,500	\$ 3,500	\$ 7,000	\$ 5,250.00	\$ 10,500
4.13									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 84,763		\$ 387,095		\$ 471,858
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	54	Assembly	\$ 900	\$ 48,600	\$ 360	\$ 19,440	\$ 1,260	\$ 68,040
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	36	Assembly	\$ 900	\$ 32,400	\$ 360	\$ 12,960	\$ 1,260	\$ 45,360
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.7	OPGW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.8	OHSW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.9	OHSW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.10	OPGW Splice Boxes	2	Set	\$ 1,746	\$ 3,492	\$ 2,274	\$ 4,548	\$ 4,020	\$ 8,040
5.11	OPGW Splice & Test	2	EA	\$ 2,520	\$ 5,040	\$ 2,520	\$ 5,040	\$ 5,040	\$ 10,080
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	72	EA	\$ 35	\$ 2,520	\$ 35	\$ 2,520	\$ 70	\$ 5,040
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	25	EA	\$ 27	\$ 675	\$ 35	\$ 875	\$ 62	\$ 1,550
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	2.1	Mile	\$ 770	\$ 1,617	\$ 1,006	\$ 2,113	\$ 1,776	\$ 3,730
5.17									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 107,544		\$ 56,496		\$ 164,040
<b>C. Blue Stores Junction to Blue Stores Substation</b>					\$ 1,025,639		\$ 3,720,722		\$ 4,746,361
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 235,526	\$ 235,526	\$ 235,526	\$ 235,526
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 237,318	\$ 237,318	\$ 237,318	\$ 237,318
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.7	Geotech	2	Location	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 33,225	\$ 33,225	\$ 33,225	\$ 33,225
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 153,000	\$ 153,000	\$ 153,000	\$ 153,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 82,051	\$ 82,051	\$ -	\$ -	\$ 82,051	\$ 82,051
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 4,746	\$ 4,746	\$ 4,746	\$ 4,746
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 82,051		\$ 861,684		\$ 943,735

**NG & NY Transco - T019 - (Segment B)**

**D. Knickerbocker 345kV Substation - Install**

Estimate Revision: **8** Total: \$ 32,913,517

<b>NG &amp; NY Transco - T019 - (Segment B)</b>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>D. Knickerbocker 345kV Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 339,050	\$ 4,006,475	\$ 4,345,525
2. SUBSTATION FOUNDATIONS	\$ 1,920,103	\$ 2,065,950	\$ 3,986,053
3. SUBSTATION STRUCTURES	\$ 912,975	\$ 912,975	\$ 1,825,950
4. MAJOR EQUIPMENT	\$ 7,100,000	\$ 940,000	\$ 8,040,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,206,500	\$ 534,500	\$ 1,741,000
6. CONTROL HOUSE / PANELS	\$ 2,098,800	\$ 1,355,800	\$ 3,454,600
7. MISC ITEMS	\$ 1,012,063	\$ 1,901,070	\$ 2,913,133
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,167,159	\$ 5,440,097	\$ 6,607,256
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 15,756,650</b>	<b>\$ 17,156,867</b>	<b>\$ 32,913,517</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 15,756,650</b>	<b>\$ 17,156,867</b>	<b>\$ 32,913,517</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Knickerbocker 345kV Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	9.125	ACRES	\$ -	\$ -	\$ 355,000	\$ 3,239,375	\$ 355,000	\$ 3,239,375
1.2	Station stone within substation fence.	3,900	CY	\$ 27	\$ 105,300	\$ 75	\$ 292,500	\$ 102	\$ 397,800
1.3	Substation Fence	2,100	LF	\$ 100	\$ 210,000	\$ 100	\$ 210,000	\$ 200	\$ 420,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide	600	LF	\$ 35	\$ 21,000	\$ 285	\$ 171,000	\$ 320	\$ 192,000
1.7	Pavement	1,600	SY	\$ -	\$ -	\$ 55	\$ 88,000	\$ 55	\$ 88,000
1.8	Gates	1	EA	\$ 2,000	\$ 2,000	\$ 2,500	\$ 2,500	\$ 4,500	\$ 4,500
1.9	Culverts / Misc. Access	1	EA	\$ 750	\$ 750	\$ 1,250	\$ 1,250	\$ 2,000	\$ 2,000
1.10	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 339,050		\$ 4,006,475		\$ 4,345,525
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	18	EA	\$ 26,145	\$ 470,610	\$ 28,000	\$ 504,000	\$ 54,145	\$ 974,610
2.1e	Switch Stand Foundations	90	EA	\$ 4,482	\$ 403,380	\$ 4,800	\$ 432,000	\$ 9,282	\$ 835,380
2.1f	Station Service Transformer Stand Foundation	4	EA	\$ 4,482	\$ 17,928	\$ 4,800	\$ 19,200	\$ 9,282	\$ 37,128
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	72	EA	\$ 4,482	\$ 322,704	\$ 4,800	\$ 345,600	\$ 9,282	\$ 668,304
2.1j	Instrument Transformer Stand Foundations	27	EA	\$ 4,482	\$ 121,014	\$ 4,800	\$ 129,600	\$ 9,282	\$ 250,614
2.1k	Arrester Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1m	Wave Trap Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p	Series Compensation System	1	EA	\$ 112,050	\$ 112,050	\$ 120,000	\$ 120,000	\$ 232,050	\$ 232,050
2.1q									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 41,832	\$ 41,832	\$ 44,800	\$ 44,800	\$ 86,632	\$ 86,632
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 9,750	\$ 9,750	\$ 9,750	\$ 9,750
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	5	EA	\$ 5,229	\$ 26,145	\$ 5,600	\$ 28,000	\$ 10,829	\$ 54,145
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,920,103		\$ 2,065,950		\$ 3,986,053
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	6	EA	\$ 37,000	\$ 222,000	\$ 37,000	\$ 222,000	\$ 74,000	\$ 444,000
3.1c	Switch Stands	15	EA	\$ 14,800	\$ 222,000	\$ 14,800	\$ 222,000	\$ 29,600	\$ 444,000
3.1d	Station Service Transformer Stand	3	EA	\$ 14,800	\$ 44,400	\$ 14,800	\$ 44,400	\$ 29,600	\$ 88,800
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	72	EA	\$ 3,700	\$ 266,400	\$ 3,700	\$ 266,400	\$ 7,400	\$ 532,800
3.1g	Instrument Transformer Stand	27	EA	\$ 1,850	\$ 49,950	\$ 1,850	\$ 49,950	\$ 3,700	\$ 99,900
3.1h	Arrester Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1j	Wave Trap Stand	3	EA	\$ 7,400	\$ 22,200	\$ 7,400	\$ 22,200	\$ 14,800	\$ 44,400
3.1k	Lightning Mast - 70'	5	EA	\$ 6,475	\$ 32,375	\$ 6,475	\$ 32,375	\$ 12,950	\$ 64,750
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 912,975		\$ 912,975		\$ 1,825,950
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks with Reactors	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	Series Compensation System	1	EA	\$ 6,500,000	\$ 6,500,000	\$ 700,000	\$ 700,000	\$ 7,200,000	\$ 7,200,000
4.1d									
4.1e									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 7,100,000		\$ 940,000		\$ 8,040,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	6	EA	\$ 40,000	\$ 240,000	\$ 15,000	\$ 90,000	\$ 55,000	\$ 330,000
5.1b	Disconnect Switches - 3ph w/ manual operator	6	EA	\$ 35,000	\$ 210,000	\$ 17,500	\$ 105,000	\$ 52,500	\$ 315,000
5.1c	VT'S	9	EA	\$ 25,000	\$ 225,000	\$ 12,000	\$ 108,000	\$ 37,000	\$ 333,000
5.1d	CT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1e	CCVT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,206,500		\$ 534,500		\$ 1,741,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 468,000	\$ 468,000	\$ 95,000	\$ 95,000	\$ 563,000	\$ 563,000
6.2	Protection and Telecom Equipment Panels	20	EA	\$ 35,000	\$ 700,000	\$ 10,000	\$ 200,000	\$ 45,000	\$ 900,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 415,800	\$ 415,800	\$ 415,800	\$ 415,800	\$ 831,600	\$ 831,600
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,098,800		\$ 1,355,800		\$ 3,454,600
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,050.0	LF	\$ 185.00	\$ 194,250	\$ 170.00	\$ 178,500	\$ 355	\$ 372,750
7.2	Rigid Bus, Fittings & Insulators	1,900.0	LF	\$ 125.07	\$ 237,633	\$ 237.10	\$ 450,490	\$ 362	\$ 688,123
7.3	Strain Bus, Connectors & Insulators	0.0	LF	\$ 39.30	\$ -	\$ 53.35	\$ -	\$ 93	\$ -
7.4	Grounding System	26,000.0	LF	\$ 6.93	\$ 180,180	\$ 32.58	\$ 847,080	\$ 40	\$ 1,027,260
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,012,063		\$ 1,901,070		\$ 2,913,133
<b>D. Knickerbocker 345kV Substation - Install</b>					\$ 14,589,491		\$ 11,716,770		\$ 26,306,261
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 263,063	\$ 263,063	\$ 263,063	\$ 263,063
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,305,382	\$ 1,305,382	\$ 1,305,382	\$ 1,305,382
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 263,063	\$ 263,063	\$ 263,063	\$ 263,063
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 263,063	\$ 263,063	\$ 263,063	\$ 263,063
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,104,501	\$ 2,104,501	\$ 2,104,501	\$ 2,104,501
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 184,144	\$ 184,144	\$ 184,144	\$ 184,144
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 657,657	\$ 657,657	\$ 657,657	\$ 657,657
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 78,919	\$ 78,919	\$ 78,919	\$ 78,919
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 280,000	\$ 280,000	\$ 280,000	\$ 280,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 1,167,159	\$ 1,167,159	\$ -	\$ -	\$ 1,167,159	\$ 1,167,159
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 26,306	\$ 26,306	\$ 26,306	\$ 26,306
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,167,159		\$ 5,440,097		\$ 6,607,256

**NG & NY Transco - T019 - (Segment B)**

**E. Greenbush Substation - Removal**

Estimate Revision: **8**

Total: \$ **71,152**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>E. Greenbush Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 12,000	\$ 12,000
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ 7,000	\$ 7,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 35,000	\$ 35,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 7,200	\$ 7,200
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 9,952	\$ 9,952
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 71,152	\$ 71,152
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 71,152	\$ 71,152

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>E. Greenbush Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.		ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.		CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence		LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Reactor Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 7,200	\$ 7,200	\$ 7,200	\$ 7,200
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	2	EA	\$ -	\$ -	\$ 2,400	\$ 4,800	\$ 2,400	\$ 4,800
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 12,000		\$ 12,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	1	EA	\$ -	\$ -	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 7,000		\$ 7,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	2	EA	\$ -	\$ -	\$ 17,500	\$ 35,000	\$ 17,500	\$ 35,000
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 35,000		\$ 35,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	2	EA	\$ -	\$ -	\$ 3,600	\$ 7,200	\$ 3,600	\$ 7,200
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cable	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 7,200		\$ 7,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	EA	\$ -	\$ -	\$ 126.25	\$ -	\$ 126	\$ -
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>E. Greenbush Substation - Removal</b>					\$ -		\$ 61,200		\$ 61,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,037	\$ 3,037	\$ 3,037	\$ 3,037
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 612	\$ 612	\$ 612	\$ 612
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 4,896	\$ 4,896	\$ 4,896	\$ 4,896
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 428	\$ -	\$ 428	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 1,530	\$ -	\$ 1,530	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 184	\$ 184	\$ 184	\$ 184
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 61	\$ -	\$ 61	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 9,952		\$ 9,952

**NG & NY Transco - T019 - (Segment B)**

**F. Schodack Substation - Install**

Estimate Revision: **8**

Total: \$ **2,579,857**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>F. Schodack Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 4,050	\$ 11,250	\$ 15,300
2. SUBSTATION FOUNDATIONS	\$ 201,690	\$ 216,000	\$ 417,690
3. SUBSTATION STRUCTURES	\$ 60,680	\$ 60,680	\$ 121,360
4. MAJOR EQUIPMENT	\$ 104,000	\$ 120,000	\$ 224,000
5. SMALL EQUIPMENT / MATERIALS	\$ 316,520	\$ 226,000	\$ 542,520
6. CONTROL HOUSE / PANELS	\$ 192,815	\$ 147,815	\$ 340,630
7. MISC ITEMS	\$ 168,552	\$ 259,305	\$ 427,857
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 83,865	\$ 406,636	\$ 490,500
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,132,172</b>	<b>\$ 1,447,686</b>	<b>\$ 2,579,857</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,132,172</b>	<b>\$ 1,447,686</b>	<b>\$ 2,579,857</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Schodack Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	150	CY	\$ 27	\$ 4,050	\$ 75	\$ 11,250	\$ 102	\$ 15,300
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 4,050		\$ 11,250		\$ 15,300
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -
2.1p									
				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 201,690	\$ 216,000	\$ 417,690		
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	4	EA	\$ 1,850	\$ 7,400	\$ 1,850	\$ 7,400	\$ 3,700	\$ 14,800
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	2	EA	\$ 3,700	\$ 7,400	\$ 3,700	\$ 7,400	\$ 7,400	\$ 14,800
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 60,680		\$ 60,680		\$ 121,360
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ 300,000	\$ -	\$ 80,000	\$ -	\$ 380,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	2	EA	\$ 52,000	\$ 104,000	\$ 60,000	\$ 120,000	\$ 112,000	\$ 224,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 104,000		\$ 120,000		\$ 224,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	6	EA	\$ 8,000	\$ 48,000	\$ 8,000	\$ 48,000	\$ 16,000	\$ 96,000
5.3f	Arresters	6	EA	\$ 3,420	\$ 20,520	\$ 6,000	\$ 36,000	\$ 9,420	\$ 56,520
5.3g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 316,520		\$ 226,000		\$ 542,520
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	2	EA	\$ 35,000	\$ 70,000	\$ 12,500	\$ 25,000	\$ 47,500	\$ 95,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 122,815	\$ 122,815	\$ 122,815	\$ 122,815	\$ 245,630	\$ 245,630
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 192,815		\$ 147,815		\$ 340,630
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	530	LF	\$ 185.00	\$ 98,050	\$ 170.00	\$ 90,100	\$ 355	\$ 188,150
7.2	Rigid Bus, Fittings & Insulators	0	LF	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.3	Strain Bus, Connectors & Insulators	300	LF	\$ 39.30	\$ 11,790	\$ 53.35	\$ 16,005	\$ 93	\$ 27,795
7.4	Grounding System	800	LF	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	24	EA	\$ 1,000	\$ 24,000	\$ 550	\$ 13,200	\$ 1,550	\$ 37,200
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
<b>TOTAL - MISC ITEMS</b>					\$ 168,552		\$ 259,305		\$ 427,857
<b>F. Schodack Substation - Install</b>					\$ 1,048,307		\$ 1,041,050		\$ 2,089,357
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 103,679	\$ 103,679	\$ 103,679	\$ 103,679
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 167,149	\$ 167,149	\$ 167,149	\$ 167,149
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,625	\$ 14,625	\$ 14,625	\$ 14,625
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,234	\$ 52,234	\$ 52,234	\$ 52,234
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,268	\$ 6,268	\$ 6,268	\$ 6,268
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 83,865	\$ 83,865	\$ -	\$ -	\$ 83,865	\$ 83,865

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 83,865		\$ 406,636		\$ 490,500

**NG & NY Transco - T019 - (Segment B)**

**G. Schodack Substation - Removal**

Estimate Revision: **8**

Total: \$ **158,349**

<b>NG &amp; NY Transco - T019 - (Segment B)</b>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>G. Schodack Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 62,400	\$ 62,400
3. SUBSTATION STRUCTURES	\$ -	\$ 73,800	\$ 73,800
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:			\$ 22,149
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 136,200	\$ 158,349
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 136,200	\$ 158,349

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Schodack Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Reactor Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Steele Transmission Pole Dead Ends (1ph.) Foundations	6	EA	\$ -	\$ -	\$ 10,400	\$ 62,400	\$ 10,400	\$ 62,400
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 62,400		\$ 62,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	6	EA	\$ -	\$ -	\$ 12,300	\$ 73,800	\$ 12,300	\$ 73,800
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 73,800		\$ 73,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	LS	\$ -	\$ -	\$ 10,500.00	\$ -	\$ 10,500	\$ -
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>G. Schodack Substation - Removal</b>					\$ -		\$ 136,200		\$ 136,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 6,759	\$ 6,759	\$ 6,759	\$ 6,759
8.3	Utility PM and Project Oversight	1	LS			\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
8.4	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
<b>Engineering</b>									
8.5	Design Engineering	1.0	LS	\$ -	\$ -	\$ 10,896	\$ 10,896	\$ 10,896	\$ 10,896
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 953	\$ -	\$ 953	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 3,405	\$ -	\$ 3,405	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 409	\$ 409	\$ 409	\$ 409
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1.0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 136	\$ -	\$ 136	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 22,149		\$ 22,149

**NG & NY Transco - T019 - (Segment B)**

**H. Churchtown Substation - Install**

Estimate Revision: **8**

Total: \$ 16,935,106

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>H. Churchtown Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 162,650	\$ 1,693,950	\$ 1,856,600
2. SUBSTATION FOUNDATIONS	\$ 943,027	\$ 1,009,800	\$ 1,952,827
3. SUBSTATION STRUCTURES	\$ 416,000	\$ 458,060	\$ 916,120
4. MAJOR EQUIPMENT	\$ 416,000	\$ 480,000	\$ 896,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,384,800	\$ 938,800	\$ 2,323,600
6. CONTROL HOUSE / PANELS	\$ 2,115,975	\$ 1,453,475	\$ 3,569,450
7. MISC ITEMS	\$ 855,378	\$ 1,282,357	\$ 2,137,735
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 506,871	\$ 2,775,903	\$ 3,282,774
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 6,800,701	\$ 10,092,345	\$ 16,935,106
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 6,800,701	\$ 10,092,345	\$ 16,935,106

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. Churchtown Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	2.1	ACRES	\$ -	\$ -	\$ 660,000	\$ 1,386,000	\$ 660,000	\$ 1,386,000
1.2	Station stone within substation fence.	1,100	CY	\$ 27	\$ 29,700	\$ 75	\$ 82,500	\$ 102	\$ 112,200
1.3	Substation Fence	1,200	LF	\$ 100	\$ 120,000	\$ 100	\$ 120,000	\$ 200	\$ 240,000
1.4	Permanent Access Road - 20'-Wide	370	LF	\$ 35	\$ 12,950	\$ 285	\$ 105,450	\$ 320	\$ 118,400
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 162,650		\$ 1,693,950		\$ 1,856,600
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	8	EA	\$ 5,229	\$ 41,832	\$ 5,600	\$ 44,800	\$ 10,829	\$ 86,632
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	22	EA	\$ 16,434	\$ 361,548	\$ 17,600	\$ 387,200	\$ 34,034	\$ 748,748
2.3e	Switch Stand Foundations	34	EA	\$ 2,988	\$ 101,592	\$ 3,200	\$ 108,800	\$ 6,188	\$ 210,392
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	20	EA	\$ 2,988	\$ 59,760	\$ 3,200	\$ 64,000	\$ 6,188	\$ 123,760
2.3h	Bus Support 1 Ph Foundations	36	EA	\$ 2,988	\$ 107,568	\$ 3,200	\$ 115,200	\$ 6,188	\$ 222,768
2.3j	Instrument Transformer Stand Foundations	51	EA	\$ 2,988	\$ 152,388	\$ 3,200	\$ 163,200	\$ 6,188	\$ 315,588
2.3k	Arrester Stand Foundations	15	EA	\$ 2,988	\$ 44,820	\$ 3,200	\$ 48,000	\$ 6,188	\$ 92,820
2.3m	Wave Trap Stand Foundations	5	EA	\$ 2,988	\$ 14,940	\$ 3,200	\$ 16,000	\$ 6,188	\$ 30,940
2.3n	Station Service Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 33,615	\$ 33,615	\$ 36,000	\$ 36,000	\$ 69,615	\$ 69,615
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 1ph.	0	LS	\$ -	\$ -	\$ 6,500	\$ -	\$ 6,500	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	1	EA	\$ 5,229	\$ 5,229	\$ 5,600	\$ 5,600	\$ 10,829	\$ 10,829
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 943,027		\$ 1,009,800		\$ 1,952,827
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	8	EA	\$ 18,500	\$ 148,000	\$ 18,500	\$ 148,000	\$ 37,000	\$ 296,000
3.3c	Switch Stands	17	EA	\$ 7,955	\$ 135,235	\$ 7,955	\$ 135,235	\$ 15,910	\$ 270,470
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	10	EA	\$ 3,330	\$ 33,300	\$ 3,330	\$ 33,300	\$ 6,660	\$ 66,600
3.3f	Bus Support 1 Ph	36	EA	\$ 1,850	\$ 66,600	\$ 1,850	\$ 66,600	\$ 3,700	\$ 133,200
3.3g	Instrument Transformer Stand	51	EA	\$ 740	\$ 37,740	\$ 740	\$ 37,740	\$ 1,480	\$ 75,480
3.3h	Arrester Stand	15	EA	\$ 740	\$ 11,100	\$ 740	\$ 11,100	\$ 1,480	\$ 22,200
3.3j	Wave Trap Stand	5	EA	\$ 3,700	\$ 18,500	\$ 3,700	\$ 18,500	\$ 7,400	\$ 37,000
3.3k	Lightning Mast	1	EA	\$ 6,475	\$ 6,475	\$ 6,475	\$ 6,475	\$ 12,950	\$ 12,950
3.3l	Station Service Transformer Support Stand	1	EA	\$ 1,110	\$ 1,110	\$ 1,110	\$ 1,110	\$ 2,220	\$ 2,220
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 458,060		\$ 458,060		\$ 916,120
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 300,000	\$ -	\$ 80,000	\$ -	\$ 380,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	8	EA	\$ 52,000	\$ 416,000	\$ 60,000	\$ 480,000	\$ 112,000	\$ 896,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 416,000		\$ 480,000		\$ 896,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	5	EA	\$ 33,000	\$ 165,000	\$ 15,000	\$ 75,000	\$ 48,000	\$ 240,000
5.3b	Disconnect Switches - 3ph w/ manual operator	16	EA	\$ 28,000	\$ 448,000	\$ 17,500	\$ 280,000	\$ 45,500	\$ 728,000
5.3c	VT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3d	CT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3e	CCVT'S	21	EA	\$ 8,000	\$ 168,000	\$ 8,000	\$ 168,000	\$ 16,000	\$ 336,000
5.3f	Arresters	15	EA	\$ 3,420	\$ 51,300	\$ 6,000	\$ 90,000	\$ 9,420	\$ 141,300
5.3g	Wave Traps	5	EA	\$ 13,000	\$ 65,000	\$ 8,000	\$ 40,000	\$ 21,000	\$ 105,000
5.3h	Station Service Transformers	1	EA	\$ 75,000	\$ 75,000	\$ 35,000	\$ 35,000	\$ 110,000	\$ 110,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	3	EA	\$ 7,500	\$ 22,500	\$ 3,600	\$ 10,800	\$ 11,100	\$ 33,300
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,384,800		\$ 938,800		\$ 2,323,600
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 292,500	\$ 292,500	\$ 85,000	\$ 85,000	\$ 377,500	\$ 377,500
6.2	Protection and Telecom Equipment Panels	26	EA	\$ 35,000	\$ 910,000	\$ 12,500	\$ 325,000	\$ 47,500	\$ 1,235,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 398,475	\$ 398,475	\$ 398,475	\$ 398,475	\$ 796,950	\$ 796,950
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,115,975		\$ 1,453,475		\$ 3,569,450
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	400.0	LF	\$ 185.00	\$ 74,000	\$ 170.00	\$ 68,000	\$ 355	\$ 142,000
7.2	Rigid Bus, Fittings & Insulators	1,250.0	LF	\$ 125.07	\$ 156,338	\$ 237.10	\$ 296,375	\$ 362	\$ 452,713
7.3	Strain Bus, Connectors & Insulators	2,025.0	LF	\$ 39.30	\$ 79,583	\$ 53.35	\$ 108,034	\$ 93	\$ 187,616
7.4	Grounding System	10,600.0	LF	\$ 6.93	\$ 73,458	\$ 32.58	\$ 345,348	\$ 40	\$ 418,806
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	72	EA	\$ 1,000	\$ 72,000	\$ 550	\$ 39,600	\$ 1,550	\$ 111,600
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 855,378		\$ 1,282,357		\$ 2,137,735
<b>H. Churchtown Substation - Install</b>					\$ 6,335,890		\$ 7,316,442		\$ 13,652,332
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 136,523	\$ 136,523	\$ 136,523	\$ 136,523
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 677,463	\$ 677,463	\$ 677,463	\$ 677,463
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 136,523	\$ 136,523	\$ 136,523	\$ 136,523
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 136,523	\$ 136,523	\$ 136,523	\$ 136,523
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,092,187	\$ 1,092,187	\$ 1,092,187	\$ 1,092,187
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	Site	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 95,566	\$ 95,566	\$ 95,566	\$ 95,566

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 341,308	\$ 341,308	\$ 341,308	\$ 341,308
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 40,957	\$ 40,957	\$ 40,957	\$ 40,957
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 91,200	\$ 91,200	\$ 91,200	\$ 91,200
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 506,871	\$ 506,871	\$ -	\$ -	\$ 506,871	\$ 506,871
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 13,652	\$ 13,652	\$ 13,652	\$ 13,652
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 506,871		\$ 2,775,903		\$ 3,282,774

**NG & NY Transco - T019 - (Segment B)**

**I. Churchtown Substation - Removal**

Estimate Revision: **8** Total: \$ **1,120,394**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>I. Churchtown Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 111,000	\$ 111,000
2. SUBSTATION FOUNDATIONS	\$ -	\$ 340,400	\$ 340,400
3. SUBSTATION STRUCTURES	\$ -	\$ 252,600	\$ 252,600
4. MAJOR EQUIPMENT	\$ -	\$ 24,600	\$ 24,600
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 60,000	\$ 60,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 25,078	\$ 25,078
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 156,716	\$ 156,716
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 1,120,394	\$ 1,120,394
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 1,120,394	\$ 1,120,394

0.0%  
0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. Churchtown Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.		ACRES	\$ -	\$ -	\$ 250,000	\$ -	\$ 250,000	\$ -
1.2	Station stone within substation fence.		CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	740	LF	\$ -	\$ -	\$ 150	\$ 111,000	\$ 150	\$ 111,000
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 111,000		\$ 111,000
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Reactor Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations		EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations		EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations		EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	18	EA	\$ -	\$ -	\$ 5,200	\$ 93,600	\$ 5,200	\$ 93,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ -	\$ -	\$ 5,200	\$ 31,200	\$ 5,200	\$ 31,200
2.3j	Instrument Transformer Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Steel Transmission Pole Deadend Fnds (1Ph)	9	EA	\$ -	\$ -	\$ 15,000	\$ 135,000	\$ 15,000	\$ 135,000
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ 67,500	\$ -	\$ 67,500	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ -	\$ -	\$ 14,200	\$ 14,200	\$ 14,200	\$ 14,200
2.5b	Generator Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	4	EA	\$ -	\$ -	\$ 5,200	\$ 20,800	\$ 5,200	\$ 20,800
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 340,400		\$ 340,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1b	Substation A-Frame Structures - Shared Column		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone		EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column		EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands		EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph		EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2f	Bus Support 1 Ph		EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand		EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	9	EA	\$ -	\$ -	\$ 6,450	\$ 58,050	\$ 6,450	\$ 58,050
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	6	EA	\$ -	\$ -	\$ 6,450	\$ 38,700	\$ 6,450	\$ 38,700
3.3g	Instrument Transformer Stand	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Steel Transmission Pole Deadend (1Ph)	9	EA	\$ -	\$ -	\$ 12,300	\$ 110,700	\$ 12,300	\$ 110,700
3.4l	Lightning Mast	4	EA	\$ -	\$ -	\$ 6,450	\$ 25,800	\$ 6,450	\$ 25,800
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -	\$ -	\$ 252,600	\$ -	\$ 252,600
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers		EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	2	EA	\$ -	\$ -	\$ 12,300	\$ 24,600	\$ 12,300	\$ 24,600
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -	\$ -	\$ 24,600	\$ -	\$ 24,600
<b>5. SMALL EQUIPMENT / MATERIALS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3d	CT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3e	CCVT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 60,000		\$ 60,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	Protection and Telecom Equipment Panels		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables		LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	535.0	LF	\$ -	\$ -	\$ 46.88	\$ 25,078	\$ 47	\$ 25,078

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.3	Strain Bus, Connectors & Insulators		LF	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 25,078		\$ 25,078
<b>I. Churchtown Substation - Removal</b>					\$ -		\$ 963,678		\$ 963,678
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 9,637	\$ 9,637	\$ 9,637	\$ 9,637
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 47,820	\$ 47,820	\$ 47,820	\$ 47,820
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 9,637	\$ 9,637	\$ 9,637	\$ 9,637
8.4	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 9,637	\$ 9,637	\$ 9,637	\$ 9,637
<b>Engineering</b>									
8.5	Design Engineering	1.0	LS	\$ -	\$ -	\$ 77,094	\$ 77,094	\$ 77,094	\$ 77,094
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 6,746	\$ -	\$ 6,746	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 24,092	\$ -	\$ 24,092	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 2,891	\$ 2,891	\$ 2,891	\$ 2,891
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1.0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 964	\$ -	\$ 964	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 156,716		\$ 156,716

**NG & NY Transco - T019 - (Segment B)**

**J. Pleasant Valley Substation - Install**

Estimate Revision: **8**

Total: \$ **8,652,672**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>J. Pleasant Valley Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 92,400	\$ 380,000	\$ 472,400
2. SUBSTATION FOUNDATIONS	\$ 414,410	\$ 442,500	\$ 856,910
3. SUBSTATION STRUCTURES	\$ 188,700	\$ 188,700	\$ 377,400
4. MAJOR EQUIPMENT	\$ 1,380,000	\$ 400,000	\$ 1,780,000
5. SMALL EQUIPMENT / MATERIALS	\$ 369,500	\$ 173,000	\$ 542,500
6. CONTROL HOUSE / PANELS	\$ 746,400	\$ 393,900	\$ 1,140,300
7. MISC ITEMS	\$ 740,939	\$ 988,454	\$ 1,729,393
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 314,588	\$ 1,439,181	\$ 1,753,769
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 4,246,937	\$ 4,405,735	\$ 8,652,672
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 4,246,937	\$ 4,405,735	\$ 8,652,672

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Pleasant Valley Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	1.00	ACRES	\$ -	\$ -	\$ 230,000	\$ 230,000	\$ 230,000	\$ 230,000
1.2	Station stone within substation fence.	1,200	CY	\$ 27	\$ 32,400	\$ 75	\$ 90,000	\$ 102	\$ 122,400
1.3	Substation Fence	600	LF	\$ 100	\$ 60,000	\$ 100	\$ 60,000	\$ 200	\$ 120,000
1.4	Permanent Access Road - 20'-Wide	0	LF			\$ 285	\$ -	\$ 285	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 92,400		\$ 380,000		\$ 472,400
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	18	EA	\$ 4,482	\$ 80,676	\$ 4,800	\$ 86,400	\$ 9,282	\$ 167,076
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	25	EA	\$ 4,482	\$ 112,050	\$ 4,800	\$ 120,000	\$ 9,282	\$ 232,050
2.1j	Instrument Transformer Stand Foundations	18	EA	\$ 4,482	\$ 80,676	\$ 4,800	\$ 86,400	\$ 9,282	\$ 167,076
2.1k	Arrester Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -
2.1p				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House Addition Foundation (20-ft x 50-ft)	1	EA	\$ 51,368	\$ 51,368	\$ 53,700	\$ 53,700	\$ 105,068	\$ 105,068
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 414,410		\$ 442,500		\$ 856,910
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	3	EA	\$ 14,800	\$ 44,400	\$ 14,800	\$ 44,400	\$ 29,600	\$ 88,800
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	25	EA	\$ 3,700	\$ 92,500	\$ 3,700	\$ 92,500	\$ 7,400	\$ 185,000
3.1g	Instrument Transformer Stand	15	EA	\$ 1,850	\$ 27,750	\$ 1,850	\$ 27,750	\$ 3,700	\$ 55,500
3.1h	Arrester Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 188,700		\$ 188,700		\$ 377,400
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks - W/ Center Tap VT and Reactors	2	EA	\$ 370,000	\$ 740,000	\$ 80,000	\$ 160,000	\$ 450,000	\$ 900,000
4.1c	Circuit Breakers - Cap Switching	2	EA	\$ 220,000	\$ 440,000	\$ 80,000	\$ 160,000	\$ 300,000	\$ 600,000
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 225,000	\$ -	\$ 60,000	\$ -	\$ 285,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 1,380,000		\$ 400,000		\$ 1,780,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ 35,000	\$ 105,000	\$ 17,500	\$ 52,500	\$ 52,500	\$ 157,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 369,500		\$ 173,000		\$ 542,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE Addition (25-ft x 50-ft)	1	EA	\$ 325,000	\$ 325,000	\$ 85,000	\$ 85,000	\$ 410,000	\$ 410,000
6.2	Protection and Telecom Equipment Panels	5	EA	\$ 35,000	\$ 175,000	\$ 12,500	\$ 62,500	\$ 47,500	\$ 237,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 246,400	\$ 246,400	\$ 246,400	\$ 246,400	\$ 492,800	\$ 492,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 746,400		\$ 393,900		\$ 1,140,300
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,200	LF	\$ 185.00	\$ 222,000	\$ 170.00	\$ 204,000	\$ 355	\$ 426,000
7.2	Rigid Bus, Fittings & Insulators	1,500	LF	\$ 125.07	\$ 187,605	\$ 237.10	\$ 355,650	\$ 362	\$ 543,255
7.3	Strain Bus, Connectors & Insulators	0	LF	\$ 13.38	\$ -	\$ 39.35	\$ -	\$ 53	\$ -
7.4	Grounding System	3,800	LF	\$ 6.93	\$ 26,334	\$ 32.58	\$ 123,804	\$ 40	\$ 150,138
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 740,939		\$ 988,454		\$ 1,729,393
<b>J. Pleasant Valley Substation - Install</b>					\$ 3,932,349		\$ 2,966,554		\$ 6,898,903
<b>8. MOB/DEMOb, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 68,989	\$ 68,989	\$ 68,989	\$ 68,989
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 342,341	\$ 342,341	\$ 342,341	\$ 342,341
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 68,989	\$ 68,989	\$ 68,989	\$ 68,989
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 68,989	\$ 68,989	\$ 68,989	\$ 68,989
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 551,912	\$ 551,912	\$ 551,912	\$ 551,912
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.7	Geotech	2	EA	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 48,292	\$ 48,292	\$ 48,292	\$ 48,292
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 172,473	\$ 172,473	\$ 172,473	\$ 172,473
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 20,697	\$ 20,697	\$ 20,697	\$ 20,697
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 82,600	\$ 82,600	\$ 82,600	\$ 82,600
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 314,588	\$ 314,588	\$ -	\$ -	\$ 314,588	\$ 314,588
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 6,899	\$ 6,899	\$ 6,899	\$ 6,899
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 314,588		\$ 1,439,181		\$ 1,753,769

**NG & NY Transco - T019 - (Segment B)**

**K. Pleasant Valley Substation - Removal**

Estimate  
Revision: **8**

Total: \$ **47,977**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>K. Pleasant Valley Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 40,500	\$ 40,500
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ -	\$ 7,477
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 40,500	\$ 47,977
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 40,500	\$ 47,977

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Pleasant Valley Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	270	LF	\$ -	\$ -	\$ 150	\$ 40,500	\$ 150	\$ 40,500
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 40,500		\$ 40,500
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Reactor Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>									
				\$ -		\$ -		\$ -	
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 14,500	\$ -	\$ 14,500	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	L.S.	\$ -	\$ -	\$ 18,937.50	\$ -	\$ 18,938	\$ -
7.3	Strain Bus, Connectors & Insulators	0	L.S.	\$ -	\$ -	\$ 19,675.00	\$ -	\$ 19,675	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>K. Pleasant Valley Substation - Removal</b>					\$ -		\$ 40,500		\$ 40,500
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,013	\$ 1,013	\$ 1,013	\$ 1,013
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 2,010	\$ 2,010	\$ 2,010	\$ 2,010
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 405	\$ 405	\$ 405	\$ 405
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 405	\$ 405	\$ 405	\$ 405
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,240	\$ 3,240	\$ 3,240	\$ 3,240
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 284	\$ 284	\$ 284	\$ 284
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 1,013	\$ -	\$ 1,013	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 122	\$ 122	\$ 122	\$ 122
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 41	\$ -	\$ 41	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 7,477		\$ 7,477

**NG & NY Transco - T019 - (Segment B)**

**Interconnection Knickerbocker Station**

Estimate  
Revision: **8**

**Total: \$ 3,627,657**

**NG & NY Transco - T019 - (Segment B)**

	Supply	Installation	Total
<b>L. Interconnection Knickerbocker Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 436,850	\$ 436,850
2. FOUNDATIONS	\$ 756,457	\$ 764,558	\$ 1,521,015
3. STRUCTURES	\$ 556,300	\$ 370,424	\$ 926,724
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 128,000	\$ 55,640	\$ 183,640
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 115,261	\$ 444,167	\$ 559,427
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,556,017	\$ 2,071,639	\$ 3,627,657
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,556,017	\$ 2,071,639	\$ 3,627,657

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Knickerbocker Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	35,000.0	SF	\$ -	\$ -	\$ 4	\$ 123,200	\$ 4	\$ 123,200
1.10	Restoration for Work Pad areas	7,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,050	\$ 0	\$ 1,050
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 436,850		\$ 436,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Tangent	2	EA	\$ 64,635	\$ 129,270	\$ 65,327	\$ 130,654	\$ 129,962	\$ 259,924
2.2	Drilled Pier - 115kV Single Circuit Single Pole Angle/DE	1	EA	\$ 76,484	\$ 76,484	\$ 77,303	\$ 77,303	\$ 153,787	\$ 153,787
2.3	Drilled Pier - 345kV Single Circuit H-Pole Angle /DE	4	EA	\$ 137,676	\$ 550,703	\$ 139,150	\$ 556,601	\$ 276,826	\$ 1,107,304
2.4									
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 756,457		\$ 764,558		\$ 1,521,015
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	1	Structure	\$ 55,315	\$ 55,315	\$ 33,189	\$ 33,189	\$ 88,504	\$ 88,504
3.2	115kV Single Circuit Single Pole Tangent	2	Structure	\$ 39,261	\$ 78,521	\$ 23,556	\$ 47,113	\$ 62,817	\$ 125,634
3.3	345kV Single Circuit Single Pole Angle /DE	4	Structure	\$ 104,730	\$ 418,921	\$ 62,838	\$ 251,353	\$ 167,569	\$ 670,274
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	7	Pole	\$ 506	\$ 3,542	\$ 5,539	\$ 38,770	\$ 6,045	\$ 42,312
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 556,300		\$ 370,424		\$ 926,724
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9					\$ -		\$ -		\$ -
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	12	Assembly	\$ 900	\$ 10,800	\$ 560	\$ 6,720	\$ 1,460	\$ 17,520
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	7	Assembly	\$ 900	\$ 6,300	\$ 560	\$ 3,920	\$ 1,460	\$ 10,220
5.5					\$ -		\$ -		\$ -
5.6	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.7	OPGW Assembly - Angle / DE	10	Assembly	\$ 250	\$ 2,500	\$ 150	\$ 1,500	\$ 400	\$ 4,000
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 128,000		\$ 55,640		\$ 183,640
<b>L. Interconnection Knickerbocker Station</b>					\$ 1,440,757		\$ 1,627,472		\$ 3,068,229
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 30,682	\$ 30,682	\$ 30,682	\$ 30,682

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 152,253	\$ 152,253	\$ 152,253	\$ 152,253
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 30,682	\$ 30,682	\$ 30,682	\$ 30,682
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 30,682	\$ 30,682	\$ 30,682	\$ 30,682
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 153,411	\$ 153,411	\$ 153,411	\$ 153,411
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 9,205	\$ 9,205	\$ 9,205	\$ 9,205
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 21,478	\$ 21,478	\$ 21,478	\$ 21,478
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 9,205	\$ 9,205	\$ 9,205	\$ 9,205
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 115,261	\$ 115,261	\$ -	\$ -	\$ 115,261	\$ 115,261
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 3,068	\$ 3,068	\$ 3,068	\$ 3,068
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 115,261		\$ 444,167		\$ 559,427

**NG & NY Transco - T019 - (Segment B)**

**M. Interconnection Churchtown Station**

Estimate  
Revision: **8**

Total: \$ **2,201,713**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>M. Interconnection Churchtown Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 436,850	\$ 436,850
2. FOUNDATIONS	\$ 212,820	\$ 615,100	\$ 827,920
3. STRUCTURES	\$ 318,188	\$ 227,557	\$ 545,745
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 44,000	\$ 27,410	\$ 71,410
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 46,001	\$ 273,787	\$ 319,787
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>621,009</b>	\$ <b>1,580,703</b>	\$ <b>2,201,713</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>621,009</b>	\$ <b>1,580,703</b>	\$ <b>2,201,713</b>

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Churchtown Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	35,000.0	SF	\$ -	\$ -	\$ 4	\$ 123,200	\$ 4	\$ 123,200
1.10	Restoration for Work Pad areas	7,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,050	\$ 0	\$ 1,050
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ -	\$ 436,850	\$ -	\$ 436,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	2	EA	\$ 30,403	\$ 60,806	\$ 30,729	\$ 61,457	\$ 61,131	\$ 122,263
2.2	Drilled Pier - 115kV Single Circuit H- Pole Tangent	3	EA	\$ 30,403	\$ 91,209	\$ 30,729	\$ 92,186	\$ 61,131	\$ 183,394
2.3	Drilled Pier - 115kV Single Circuit Single Pole Angle/ DE	2	EA	\$ 30,403	\$ 60,806	\$ 30,729	\$ 61,457	\$ 61,131	\$ 122,263
2.4									
2.5	Rock Excavation Adder	200	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 212,820		\$ 615,100		\$ 827,920
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/ DE	4	Structure	\$ 49,216	\$ 196,864	\$ 29,530	\$ 118,118	\$ 78,746	\$ 314,982
3.2	115kV Single Circuit Single Pole Tangent	3	Structure	\$ 39,261	\$ 117,782	\$ 23,556	\$ 70,669	\$ 62,817	\$ 188,451
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	7	Pole	\$ 506	\$ 3,542	\$ 5,539	\$ 38,770	\$ 6,045	\$ 42,312
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 318,188		\$ 227,557		\$ 545,745
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	18	Assembly	\$ 900	\$ 16,200	\$ 560	\$ 10,080	\$ 1,460	\$ 26,280
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	28	Assembly	\$ 900	\$ 25,200	\$ 560	\$ 15,680	\$ 1,460	\$ 40,880
5.5					\$ -		\$ -		\$ -
5.6	OPGW Assembly - Tangent	3	Assembly	\$ 200	\$ 600	\$ 150	\$ 450	\$ 350	\$ 1,050
5.7	OPGW Assembly - Angle / DE	8	Assembly	\$ 250	\$ 2,000	\$ 150	\$ 1,200	\$ 400	\$ 3,200
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 44,000		\$ 27,410		\$ 71,410
<b>M. Interconnection Churchtown Station</b>					\$ 575,008		\$ 1,306,917		\$ 1,881,925
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
6.1	Contractor Mobilization / Demobilization								
	Mob / Demob	1	LS	\$ -	\$ -	\$ 18,819	\$ 18,819	\$ 18,819	\$ 18,819
	Project Management, Material Handling & Amenities								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 93,386	\$ 93,386	\$ 93,386	\$ 93,386
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 18,819	\$ 18,819	\$ 18,819	\$ 18,819
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 18,819	\$ 18,819	\$ 18,819	\$ 18,819
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 94,096	\$ 94,096	\$ 94,096	\$ 94,096
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 5,646	\$ 5,646	\$ 5,646	\$ 5,646
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 13,173	\$ 13,173	\$ 13,173	\$ 13,173
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,646	\$ 5,646	\$ 5,646	\$ 5,646
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 46,001	\$ 46,001	\$ -	\$ -	\$ 46,001	\$ 46,001
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 1,882	\$ 1,882	\$ 1,882	\$ 1,882
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 46,001		\$ 273,787		\$ 319,787

**NG & NY Transco - T019 - (Segment B)**

**N. Interconnection Milan Station**

Estimate Revision: **8** Total: \$ **689,020**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>N. Interconnection Milan Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 121,100	\$ 121,100
2. FOUNDATIONS	\$ 84,375	\$ 135,279	\$ 219,654
3. STRUCTURES	\$ 130,328	\$ 88,667	\$ 218,994
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 14,600	\$ 9,040	\$ 23,640
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 18,344	\$ 87,288	\$ 105,632
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
SUBTOTAL:	\$ 247,647	\$ 441,373	\$ 689,020
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
TOTAL:	\$ 247,647	\$ 441,373	\$ 689,020

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Milan Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	1.0	Acre	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	500.0	LF	\$ -	\$ -	\$ 4	\$ 2,000	\$ 4	\$ 2,000
1.5	Matting - Access and ROW	500.0	LF	\$ -	\$ -	\$ 70	\$ 35,000	\$ 70	\$ 35,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	10,000.0	SF	\$ -	\$ -	\$ 4	\$ 35,200	\$ 4	\$ 35,200
1.10	Restoration for Work Pad areas	2,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 300	\$ 0	\$ 300
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ -	\$ 121,100	\$ -	\$ 121,100
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115KV Single Circuit Single Pole Angle/DE	2	EA	\$ 42,187	\$ 84,375	\$ 42,639	\$ 85,279	\$ 84,827	\$ 169,654
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	25	CY	\$ -	\$ -	\$ 2,000	\$ 50,000	\$ 2,000	\$ 50,000
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 84,375		\$ 135,279		\$ 219,654
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	2	Structure	\$ 64,658	\$ 129,316	\$ 38,795	\$ 77,590	\$ 103,453	\$ 206,905
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	2	Pole	\$ 506	\$ 1,012	\$ 5,539	\$ 11,077	\$ 6,045	\$ 12,089
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 130,328		\$ 88,667		\$ 218,994
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	14	Assembly	\$ 900	\$ 12,600	\$ 560	\$ 7,840	\$ 1,460	\$ 20,440
5.5					\$ -		\$ -		\$ -
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 14,600		\$ 9,040		\$ 23,640
<b>N. Interconnection Milan Station</b>					\$ 229,303		\$ 354,085		\$ 583,388
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
6.1	Contractor Mobilization / Demobilization	1	LS	\$ -	\$ -	\$ 5,834	\$ 5,834	\$ 5,834	\$ 5,834
	Project Management, Material Handling & Amenities								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 28,949	\$ 28,949	\$ 28,949	\$ 28,949
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 5,834	\$ 5,834	\$ 5,834	\$ 5,834
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 5,834	\$ 5,834	\$ 5,834	\$ 5,834
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 29,169	\$ 29,169	\$ 29,169	\$ 29,169
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 4,084	\$ 4,084	\$ 4,084	\$ 4,084
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,750	\$ 1,750	\$ 1,750	\$ 1,750
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 18,344	\$ 18,344	\$ -	\$ -	\$ 18,344	\$ 18,344
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 583	\$ 583	\$ 583	\$ 583
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 18,344		\$ 87,288		\$ 105,632

**NG & NY Transco - T019 - (Segment B)**

**O. NUF to mitigate NY to NE interface transfer limit degradation**

Estimate  
Revision: **8**

**Total: \$ 21,428,571**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>SUF 1</b>	<b>Transmission Line Upgrade Cricket Valley - Connecticut Border to Long Mountain</b>								
1.1	Line Upgrade	1.00	LS		\$ -		\$ -	\$ 21,428,571	\$ 21,428,571
	<b>Subtotal SUG 1 Direct Cost</b>				\$ -		\$ -		\$ 21,428,571
2	Engineering, T&C, PM, Indirects (25%)				\$ -		\$ -		\$ 5,357,143
	<b>TOTAL:</b>				\$ -		\$ -		\$ 26,785,714

**NG & NY Transco - T019 - (Segment B)**

**P. NUF proposed as element of the Project (Fishkill and New Scotland Terminals)**

Estimate Revision: 4

**Total: \$ 774,000**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
SUF SS1	Replace Disconnect Switch and Wavetrap on Roseton to East Fishkill #305 345kV Line	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 222,449	\$ 223,000
SUF SS1	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 33,480	\$ 34,000
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 65,000
<b>SUF SS1</b>	<b>SUF SS1 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 322,000</b>
SUF SS2	Replace Line Trap, 3" Bus Tue, Switches 277 & 288, and 3.5" bus Tube at New Scotland	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 451,817	\$ 452,000
SUF SS2	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 64,200	\$ 65,000
SUF SS2	Engineering, T&C, PM, Indirects (15%)		LS %						\$ 130,000
<b>SUF SS2</b>	<b>SUF SS2 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 647,000</b>
SUF SS3		1	LS					\$ -	\$ -
SUF SS3	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS3	Engineering, T&C, PM, Indirects (15%)		LS %						\$ -
<b>SUF SS3</b>	<b>SUF SS3 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
SUF SS4		-	LS	\$ -	\$ -	\$ -	\$ -		\$ -
SUF SS4	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS4	Engineering, T&C, PM, Indirects (15%)		LS %						\$ -
<b>SUF SS4</b>	<b>SUF SS4 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
SUF SS5		-	LS	\$ -	\$ -	\$ -	\$ -		\$ -
SUF SS5	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS5	Engineering, T&C, PM, Indirects (15%)		LS %						\$ -
<b>SUF SS5</b>	<b>SUF SS5 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ -</b>
<b>STATIONS SUF DIRECT TOTAL:</b>									<b>\$ 774,000</b>
<b>STATIONS SUF INDIRECT TOTAL:</b>									<b>\$ 195,000</b>
<b>STATIONS SUF TOTAL</b>									<b>\$ 969,000</b>

**NG & NY Transco - T019 - (Segment B)**  
**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type. 20% of the total length of the line is assumed to use Type 1 Gravel road and 80% of the line length access to be used wood matting. In addition 75 feet of wood matting is included from the access matting to the work pad area matting. The estimate also include 5,000 square feet of wood matting for each structure work area within the ROW. For the ground restoration (seed, straw and woven mat), 20% of the work pad area included.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 4.315% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	Knickerbocker to Churchtown substation; 0.4 miles of 345kV conductor from the junction have been added.
25	An additional Quantity of 5% have been added to conductors, OPGW, & OHSW for sag and jumpers.
26	Rock excavation depth in Foundation data provided in the proposal.
27	Cricket Valley to Long Mountain line upgrade: Network Upgrade (NUF) costs to mitigate NY to NE interface transfer limit degradation were based on possible solutions identified during the June 2018 SIS process
28	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.



NextEra Energy (T022)			
Description		Total Amount (In thousand \$)	
Direct Cost	1	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$33,783
	1.2	Foundations	\$17,271
	1.3	Structures	\$49,013
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$25,925
	1.5	Insulators, Fitting and Hardwares	\$9,609
	Subtotal (1)		<b>\$135,602</b>
	2	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$15,110
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$0
	2.4	Churchtown Substation	\$14,897
	2.5	Pleasant Valley Substation	\$2,798
	2.6	Substation Interconnections	\$6,769
Subtotal (2)		<b>\$39,635</b>	
Total (1+2)		\$175,237	
Contractors Mark-up (15% of Total 1+2)		\$26,286	
Total Direct Cost (A)		<b>\$201,523</b>	
Indirect Cost	3	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$1,752
	3.2	Project Management, Material Handling & Amenities	\$14,399
	3.3	Engineering	\$11,654
	3.4	Testing & Commissioning	\$920
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$10,365
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
Total Indirect Cost (3)		<b>\$46,718</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$248,241</b>	
4	<b>Network Upgrade Facilities (NUF)</b>		
	4.1	NUF proposed as element of the Project	\$0
	4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000
Subtotal NUF Cost (C)		<b>\$30,000</b>	
Total Project Cost (B+C) 2017 \$		<b>\$278,241</b>	
Total Project Cost 2018 \$		<b>\$286,588</b>	

**NextEra T022 (Segment B)**

Estimate Revision: 8

<i>NextEra T022 (Segment B) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 59,622,815
Direct Labor, Material & Equipment Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 71,233,183
Direct Labor, Material & Equipment Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 4,746,361
Direct Labor, Material & Equipment Costs	D. Knickerbocker 345kV Substation - Install	\$ 15,109,913
Direct Labor, Material & Equipment Costs	E.Greenbush Substation Removal	\$ 61,200
Direct Labor, Material & Equipment Costs	F.	\$ -
Direct Labor, Material & Equipment Costs	G.	\$ -
Direct Labor, Material & Equipment Costs	H. North Churchtown Substation - Install	\$ 14,897,294
Direct Labor, Material & Equipment Costs	I.	\$ -
Direct Labor, Material & Equipment Costs	J. Pleasant Valley Substation - Install	\$ 2,797,952
Direct Labor, Material & Equipment Costs	K.	\$ -
Direct Labor, Material & Equipment Costs	L. Interconnection Knickerbocker Station	\$ 1,534,845
Direct Labor, Material & Equipment Costs	M. Interconnection Churchtown Station	\$ 4,610,341
Direct Labor, Material & Equipment Costs	N. Interconnection Milan Station	\$ 623,428
Direct Labor, Material & Equipment Costs	O.NUF to mitigate NY to NE interface transfer limit degradation	\$ 21,428,571
Direct Labor, Material & Equipment Costs	P.NUF proposed as element of the Project	\$ -
<b>SUBTOTAL:</b>		\$ 196,665,904
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		\$ 29,499,886
<b>CONTINGENCY ON ENTIRE PROJECT</b>		\$ -
<b>TOTAL DIRECT:</b>		\$ 226,165,789

<i>NextEra T022 (Segment B) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 13,205,227
Indirect Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 15,145,370
Indirect Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 1,003,285
Indirect Costs	D. Knickerbocker 345kV Substation - Install	\$ 4,008,194
Indirect Costs	E.Greenbush Substation Removal	\$ 11,210
Indirect Costs	F.	\$ -
Indirect Costs	G.	\$ -
Indirect Costs	H. North Churchtown Substation - Install	\$ 3,698,349
Indirect Costs	I.	\$ -
Indirect Costs	J. Pleasant Valley Substation - Install	\$ 728,283
Indirect Costs	K. Pleasant Valley Substation - Removal	\$ -
Indirect Costs	L. Interconnection Knickerbocker Station	\$ 292,045
Indirect Costs	M. Interconnection Churchtown Station	\$ 876,545
Indirect Costs	N. Interconnection Milan Station	\$ 121,652
Indirect Costs	O.NUF to mitigate NY to NE interface transfer limit degradation	\$ 5,357,143
Indirect Costs	P.NUF proposed as element of the Project	\$ -
Indirect Costs	Legal, Permitting, and Environmental Fees	\$ 7,627,609
<b>TOTAL INDIRECT:</b>		\$ 52,074,912

**TOTAL ESTIMATED COST: \$ 278,240,701**

**NextEra T022 (Segment B)**

**A. Transmission Line Knickerbocker to Churchtown**

Estimate Revision: **8** Total: \$ **72,828,042**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>A. Transmission Line Knickerbocker to Churchtown</b>			
1. CLEARING & ACCESS	\$ 11,500	\$ 13,043,953	\$ 13,055,453
2. FOUNDATIONS	\$ 1,519,868	\$ 4,432,528	\$ 5,952,396
3. STRUCTURES	\$ 4,990,679	\$ 19,604,107	\$ 24,594,786
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,943,787	\$ 8,681,855	\$ 11,625,642
5. INSULATORS, FITTINGS, HARDWARE	\$ 2,896,560	\$ 1,497,978	\$ 4,394,539
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 988,992	\$ 12,216,235	\$ 13,205,227
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 13,351,386	\$ 59,476,656	\$ 72,828,042
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 13,351,386	\$ 59,476,656	\$ 72,828,042

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Knickerbocker to Churchtown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	10.0	Acre	\$ -	\$ -	\$ 15,000	\$ 150,000	\$ 15,000	\$ 150,000
1.2	Clearing the ROW - Light (mowing)	55.0	Acre		\$ -	\$ 5,000	\$ 275,000	\$ 5,000	\$ 275,000
1.3	Permanent Access Road	23,126	LF	\$ -	\$ -	\$ 45.00	\$ 1,040,688	\$ 45	\$ 1,040,688
1.4	Silt Fence	115,632	LF	\$ -	\$ -	\$ 4.00	\$ 462,528	\$ 4	\$ 462,528
1.5	Matting - Access and ROW	92,506	LF	\$ -	\$ -	\$ 70.00	\$ 6,475,392	\$ 70	\$ 6,475,392
1.6	Matting - To Work Area	11,925	LF	\$ -	\$ -	\$ 70.00	\$ 834,750	\$ 70	\$ 834,750
1.7	Snow Removal	21.9	Mile	\$ -	\$ -	\$ 16,000	\$ 350,400	\$ 16,000	\$ 350,400
1.8	ROW Restoration	21.9	Mile	\$ -	\$ -	\$ 10,000	\$ 219,000	\$ 10,000	\$ 219,000
1.9	Work Pads	795,000	SF	\$ -	\$ -	\$ 3.52	\$ 2,798,400	\$ 4	\$ 2,798,400
1.10	Restoration for Work Pad areas	159,000	SF	\$ -	\$ -	\$ 0.15	\$ 23,850	\$ 0	\$ 23,850
1.11	Temporary Access Bridge	9	EA	\$ -	\$ -	\$ 20,035	\$ 180,315	\$ 20,035	\$ 180,315
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	4	EA	\$ -	\$ -	\$ 4,580	\$ 18,320	\$ 4,580	\$ 18,320
1.14	Maintenance and Protection of Traffic on Public Roads	47	EA	\$ -	\$ -	\$ 4,130	\$ 194,110	\$ 4,130	\$ 194,110
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	2	EA	\$ 2,000	\$ 4,000	\$ 2,500	\$ 5,000	\$ 4,500	\$ 9,000
1.17	Concrete Washout Station	2	EA	\$ -	\$ -	\$ 1,850	\$ 3,700	\$ 1,850	\$ 3,700
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 11,500		\$ 13,043,953		\$ 13,055,453
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115/345KV D/C DEADEND, STEEL	13	EA	\$ 86,969	\$ 1,130,593	\$ 87,900	\$ 1,142,702	\$ 174,869	\$ 2,273,295
2.2	Drilled Pier - 345KV S/C DEADEND, STEEL	1	EA	\$ 39,770	\$ 39,770	\$ 40,196	\$ 40,196	\$ 79,966	\$ 79,966
2.3	Direct Embed - 115/345KV D/C TANGENT, CONCRETE	145	EA	\$ 2,410	\$ 349,504	\$ 16,391	\$ 2,376,630	\$ 18,801	\$ 2,726,134
2.4	Rock Excavation Adder	436.5	CY	\$ -	\$ -	\$ 2,000	\$ 873,000	\$ 2,000	\$ 873,000
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.13									
2.14									
2.15									
2.16									
2.17									
2.18									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,519,868		\$ 4,432,528		\$ 5,952,396
<b>3. STRUCTURES</b>									
3.1	115/345KV D/C DEADEND, STEEL	13	Structure	\$ 131,581	\$ 1,710,556	\$ 78,949	\$ 1,026,334	\$ 210,530	\$ 2,736,890
3.2	345KV S/C DEADEND, STEEL	1	Structure	\$ 51,800	\$ 51,800	\$ 31,080	\$ 31,080	\$ 82,880	\$ 82,880
3.3	115/345KV D/C TANGENT, CONCRETE	145	Structure	\$ 21,709	\$ 3,147,869	\$ 91,587	\$ 13,280,072	\$ 113,296	\$ 16,427,940
3.4	Remove Existing Concrete Foundation	688	EA	\$ -	\$ -	\$ 3,250	\$ 2,236,000	\$ 3,250	\$ 2,236,000
3.5	Remove Existing Structure and Accessories	172	EA	\$ -	\$ -	\$ 12,500	\$ 2,150,000	\$ 12,500	\$ 2,150,000
3.6	Install Grounding and Grounding Accessories	159	Pole	\$ 506	\$ 80,454	\$ 5,539	\$ 880,622	\$ 6,045	\$ 961,076
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 4,990,679		\$ 19,604,107		\$ 24,594,786
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 1,033kcmil 54/7 ACSS "Curlew"	728,482	LF	\$ 2.82	\$ 2,054,319	\$ 5.00	\$ 3,642,410	\$ 7.82	\$ 5,696,729
4.2	(1) OPGW 36 Fiber AC-33/38/571	121,414	LF	\$ 1.35	\$ 163,909	\$ 5.00	\$ 607,070	\$ 6.35	\$ 770,979
4.3	(1) 3/8" EHS7 Steel	121,414	LF	\$ 0.47	\$ 57,065	\$ 5.00	\$ 607,070	\$ 5.47	\$ 664,135
4.4	Remove Existing Cable From Existing Structures	43.8	Mile	\$ -	\$ -	\$ 30,000	\$ 1,314,000	\$ 30,000.00	\$ 1,314,000
4.5	Remove Existing OPGW Cable and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.6	Remove Existing OHSW and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.7	115kV - (1) 795kcmil 26/7 ACSS "Drake"	364,241	LF	\$ 1.72	\$ 626,495	\$ 5.00	\$ 1,821,205	\$ 6.72	\$ 2,447,700
4.8	Rider Poles (47 Locations)	24	Set	\$ 1,750	\$ 42,000	\$ 3,500	\$ 84,000	\$ 5,250.00	\$ 126,000
4.9	Rider Poles - Relocated	23	Set	\$ -	\$ -	\$ 3,500	\$ 80,500	\$ 3,500.00	\$ 80,500
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,943,787		\$ 8,681,855		\$ 11,625,642
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	725	Assembly	\$ 1,800	\$ 1,305,000	\$ 720	\$ 522,000	\$ 2,520	\$ 1,827,000
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	870	Assembly	\$ 900	\$ 783,000	\$ 560	\$ 487,200	\$ 1,460	\$ 1,270,200
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	210	Assembly	\$ 1,800	\$ 378,000	\$ 720	\$ 151,200	\$ 2,520	\$ 529,200
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	91	Assembly	\$ 900	\$ 81,900	\$ 560	\$ 50,960	\$ 1,460	\$ 132,860
5.5				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	Angle - V-String (1-Group of 18-Bells Each Assembly)		Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.7	H-Frame - Tangent Insulators (4-Assemblies Each Structure (2-Groups of 18-Bells Each Assembly))		Assembly	\$ 3,600	\$ -	\$ 1,440	\$ -	\$ 5,040	\$ -
5.8	OPGW Assembly - Tangent	145	Assembly	\$ 200	\$ 29,000	\$ 150	\$ 21,750	\$ 350	\$ 50,750
5.9	OPGW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
5.10	OHSW Assembly - Tangent	145	Assembly	\$ 200	\$ 29,000	\$ 150	\$ 21,750	\$ 350	\$ 50,750
5.11	OHSW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.12	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.13	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.14	Spacer - Conductor	3,659	EA	\$ 50	\$ 182,950	\$ 35	\$ 128,065	\$ 85	\$ 311,015
5.15	Vibration Dampers - Conductor	878	EA	\$ 35	\$ 30,730	\$ 35	\$ 30,730	\$ 70	\$ 61,460
5.16	Shield wire / OPGW Dampers, Misc. Fittings	444	EA	\$ 27	\$ 11,988	\$ 35	\$ 15,540	\$ 62	\$ 27,528
5.17									
5.18									
5.19									
5.20									
5.21	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.22	Misc. materials (Signs and Markers)	21.9	Mile	\$ 770	\$ 16,863	\$ 1,006	\$ 22,031	\$ 1,776	\$ 38,894
5.23		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 2,896,560		\$ 1,497,978		\$ 4,394,539
<b>A. Transmission Line Knickerbocker to Churchtown</b>					\$ 12,362,395		\$ 47,260,421		\$ 59,622,815
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 596,228	\$ 596,228	\$ 596,228	\$ 596,228
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,706,691	\$ 3,706,691	\$ 3,706,691	\$ 3,706,691
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 596,228	\$ 596,228	\$ 596,228	\$ 596,228
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 596,228	\$ 596,228	\$ 596,228	\$ 596,228
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,981,141	\$ 2,981,141	\$ 2,981,141	\$ 2,981,141
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 178,868	\$ 178,868	\$ 178,868	\$ 178,868
6.7	Geotech	22	Location	\$ -	\$ -	\$ 3,500	\$ 77,000	\$ 3,500	\$ 77,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 417,360	\$ 417,360	\$ 417,360	\$ 417,360
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 178,868	\$ 178,868	\$ 178,868	\$ 178,868
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,788,000	\$ 2,788,000	\$ 2,788,000	\$ 2,788,000
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 988,992	\$ 988,992	\$ -	\$ -	\$ 988,992	\$ 988,992
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 59,623	\$ 59,623	\$ 59,623	\$ 59,623
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 988,992		\$ 12,216,235		\$ 13,205,227

**NextEra T022 (Segment B)**

**B. Transmission Line Churchtown to Pleasant Valley**

Estimate  
Revision: 8

Total: \$ 86,378,553

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>B. Transmission Line Churchtown to Pleasant Valley</b>			
1. CLEARING & ACCESS	\$ 14,000	\$ 19,309,466	\$ 19,323,466
2. FOUNDATIONS	\$ 1,106,161	\$ 9,049,991	\$ 10,156,152
3. STRUCTURES	\$ 3,541,211	\$ 19,333,959	\$ 22,875,169
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,493,383	\$ 10,334,110	\$ 13,827,493
5. INSULATORS, FITTINGS, HARDWARE	\$ 3,450,934	\$ 1,599,968	\$ 5,050,903
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 928,455	\$ 14,216,915	\$ 15,145,370
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 12,534,144	\$ 73,844,409	\$ 86,378,553
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 12,534,144	\$ 73,844,409	\$ 86,378,553

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Churchtown to Pleasant Valley</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	63.0	Acre	\$ -	\$ -	\$ 5,000	\$ 315,000	\$ 5,000	\$ 315,000
1.3	Permanent Access Road	34,108.8	LF	\$ -	\$ -	\$ 45	\$ 1,534,896	\$ 45	\$ 1,534,896
1.4	Silt Fence	170,544.0	LF	\$ -	\$ -	\$ 4	\$ 682,176	\$ 4	\$ 682,176
1.5	Matting - Access and ROW	136,435.2	LF	\$ -	\$ -	\$ 70	\$ 9,550,464	\$ 70	\$ 9,550,464
1.6	Matting - To Work Area	18,450.0	LF	\$ -	\$ -	\$ 70	\$ 1,291,500	\$ 70	\$ 1,291,500
1.7	Snow Removal	32.3	Mile	\$ -	\$ -	\$ 16,000	\$ 516,800	\$ 16,000	\$ 516,800
1.8	ROW Restoration	32.3	Mile	\$ -	\$ -	\$ 10,000	\$ 323,000	\$ 10,000	\$ 323,000
1.9	Work Pads	1,230,000.0	SF	\$ -	\$ -	\$ 4	\$ 4,329,600	\$ 4	\$ 4,329,600
1.10	Restoration for Work Pad areas	246,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 36,900	\$ 0	\$ 36,900
1.11	Temporary Access Bridge	14	EA	\$ -	\$ -	\$ 20,035	\$ 280,490	\$ 20,035	\$ 280,490
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	12	EA	\$ -	\$ -	\$ 4,580	\$ 54,960	\$ 4,580	\$ 54,960
1.14	Maintenance and Protection of Traffic on Public Roads	86	EA	\$ -	\$ -	\$ 4,130	\$ 355,180	\$ 4,130	\$ 355,180
1.15	Gates	4	EA	\$ 2,000	\$ 8,000	\$ 2,500	\$ 10,000	\$ 4,500	\$ 18,000
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 14,000		\$ 19,309,466		\$ 19,323,466
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV S/C DEADEND, STEEL	17	EA	\$ 43,731	\$ 743,425	\$ 44,199	\$ 751,387	\$ 87,930	\$ 1,494,811
2.2	Direct Embed - 345KV S/C TANGENT, CONCRETE	229	EA	\$ 1,584	\$ 362,736	\$ 10,771	\$ 2,466,605	\$ 12,355	\$ 2,829,341
2.3									
2.4									
2.5	Rock Excavation Adder	2,916.0	CY	\$ -	\$ -	\$ 2,000	\$ 5,832,000	\$ 2,000	\$ 5,832,000
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,106,161		\$ 9,049,991		\$ 10,156,152

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3. STRUCTURES</b>									
3.1	345KV S/C DEADEND, STEEL	17	Structure	\$ 49,950	\$ 849,150	\$ 29,970	\$ 509,490	\$ 79,920	\$ 1,358,640
3.2	345KV S/C TANGENT, CONCRETE	229	Structure	\$ 11,212	\$ 2,567,585	\$ 47,301	\$ 10,831,998	\$ 58,513	\$ 13,399,582
3.3									
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12	Remove Existing Foundation	1,040	EA	\$ -	\$ -	\$ 3,250	\$ 3,380,000	\$ 3,250	\$ 3,380,000
3.13	Remove Existing Structure and Accessories	260	EA	\$ -	\$ -	\$ 12,500	\$ 3,250,000	\$ 12,500	\$ 3,250,000
3.14	Install Grounding and Grounding Accessories	246	Structure	\$ 506	\$ 124,476	\$ 5,539	\$ 1,362,471	\$ 6,045	\$ 1,486,947
3.15									
3.16									
3.17									
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 3,541,211		\$ 19,333,959		\$ 22,875,169
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 1,033kcmil 54/7 ACSS "Curlew"	1,094,386	LF	\$ 2.82	\$ 3,086,169	\$ 5.00	\$ 5,471,930	\$ 7.82	\$ 8,558,099
4.2	(1) OPGW 36 Fiber AC-33/38/571	182,398	LF	\$ 1.35	\$ 246,237	\$ 5.00	\$ 911,990	\$ 6.35	\$ 1,158,227
4.3	(1) 3/8" EHS7 Steel	182,398	LF	\$ 0.47	\$ 85,727	\$ 5.00	\$ 911,990	\$ 5.47	\$ 997,717
4.5	Remove Existing 115KV Cable From Existing Structures	65.2	Mile	\$ -	\$ -	\$ 30,000	\$ 1,956,000	\$ 30,000.00	\$ 1,956,000
4.6	Remove Existing OPGW Cable and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.7	Remove Existing OHSW and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.8	115KV - (1) 795kcmil 26/7 ACSS "Drake"	-	LF	\$ 1.72	\$ -	\$ 5.00	\$ -	\$ 6.72	\$ -
4.9									
4.10	Rider Poles - Relocated	43	Set	\$ -	\$ -	\$ 3,500	\$ 150,500	\$ 3,500.00	\$ 150,500
4.11	Rider Poles (86 Total)	43	EA	\$ 1,750	\$ 75,250	\$ 3,500	\$ 150,500	\$ 5,250.00	\$ 225,750
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,493,383		\$ 10,334,110		\$ 13,827,493
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345KV Tangent (1-Group of 18-Bells Each Assembly)	1,374	Assembly	\$ 1,800	\$ 2,473,200	\$ 720	\$ 989,280	\$ 2,520	\$ 3,462,480
5.2	115KV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345KV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	255	Assembly	\$ 1,800	\$ 459,000	\$ 720	\$ 183,600	\$ 2,520	\$ 642,600
5.4	115KV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	229	Assembly	\$ 200	\$ 45,800	\$ 150	\$ 34,350	\$ 350	\$ 80,150
5.6	OPGW Assembly - Angle / DE	34	Assembly	\$ 250	\$ 8,500	\$ 150	\$ 5,100	\$ 400	\$ 13,600
5.7	OHSW Assembly - Tangent	229	Assembly	\$ 200	\$ 45,800	\$ 150	\$ 34,350	\$ 350	\$ 80,150
5.8	OHSW Assembly - Angle / DE	34	Assembly	\$ 250	\$ 8,500	\$ 150	\$ 5,100	\$ 400	\$ 13,600
5.9	OPGW Splice Boxes	12	Set	\$ 1,746	\$ 20,954	\$ 2,274	\$ 27,288	\$ 4,020	\$ 48,242
5.10	OPGW Splice & Test	12	EA	\$ 2,520	\$ 30,240	\$ 2,520	\$ 30,240	\$ 5,040	\$ 60,480
5.11	Spacer - Conductor	5,414	EA	\$ 50	\$ 270,700	\$ 35	\$ 189,490	\$ 85	\$ 460,190
5.12	Vibration Dampers - Conductor	1,299	EA	\$ 35	\$ 45,465	\$ 35	\$ 45,465	\$ 70	\$ 90,930
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	656	EA	\$ 27	\$ 17,712	\$ 35	\$ 22,960	\$ 62	\$ 40,672
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	32.6	Mile	\$ 770	\$ 25,064	\$ 1,006	\$ 32,745	\$ 1,776	\$ 57,809
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 3,450,934		\$ 1,599,968		\$ 5,050,903
<b>B. Transmission Line Churchtown to Pleasant Valley</b>					\$ 11,605,689		\$ 59,627,494		\$ 71,233,183
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 712,332	\$ 712,332	\$ 712,332	\$ 712,332
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 4,428,496	\$ 4,428,496	\$ 4,428,496	\$ 4,428,496
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 712,332	\$ 712,332	\$ 712,332	\$ 712,332

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 712,332	\$ 712,332	\$ 712,332	\$ 712,332
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,561,659	\$ 3,561,659	\$ 3,561,659	\$ 3,561,659
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 213,700	\$ 213,700	\$ 213,700	\$ 213,700
6.7	Geotech	33	Location	\$ -	\$ -	\$ 3,500	\$ 115,500	\$ 3,500	\$ 115,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 498,632	\$ 498,632	\$ 498,632	\$ 498,632
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 213,700	\$ 213,700	\$ 213,700	\$ 213,700
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 2,937,000	\$ 2,937,000	\$ 2,937,000	\$ 2,937,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 928,455	\$ 928,455	\$ -	\$ -	\$ 928,455	\$ 928,455
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 71,233	\$ 71,233	\$ 71,233	\$ 71,233
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 928,455	\$ 14,216,915	\$ 14,216,915	\$ 15,145,370	\$ 15,145,370

**NextEra T022 (Segment B)**

**C. Blue Stores Junction to Blue Stores Substation**

Estimate Revision: **8**

Total: \$ **5,749,646**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>C. Blue Stores Junction to Blue Stores Substation</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,404,512	\$ 1,404,512
2. FOUNDATIONS	\$ 236,848	\$ 925,954	\$ 1,162,802
3. STRUCTURES	\$ 596,484	\$ 946,665	\$ 1,543,149
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 84,763	\$ 387,095	\$ 471,858
5. INSULATORS, FITTINGS, HARDWARE	\$ 107,544	\$ 56,496	\$ 164,040
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 82,051	\$ 921,234	\$ 1,003,285
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
SUBTOTAL:	\$ 1,107,690	\$ 4,641,956	\$ 5,749,646
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
TOTAL:	\$ 1,107,690	\$ 4,641,956	\$ 5,749,646

0.0%

0.0%

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	4.0	Acre	\$ -	\$ -	\$ 5,000	\$ 20,000	\$ 5,000	\$ 20,000
1.3	Permanent Access Road	2,217.6	LF	\$ -	\$ -	\$ 45	\$ 99,792	\$ 45	\$ 99,792
1.4	Silt Fence	11,088.0	LF	\$ -	\$ -	\$ 4	\$ 44,352	\$ 4	\$ 44,352
1.5	Matting - Access and ROW	8,870.4	LF	\$ -	\$ -	\$ 70	\$ 620,928	\$ 70	\$ 620,928
1.6	Matting - To Work Area	1,800.0	LF	\$ -	\$ -	\$ 70	\$ 126,000	\$ 70	\$ 126,000
1.7	Snow Removal	2.1	Mile	\$ -	\$ -	\$ 16,000	\$ 33,600	\$ 16,000	\$ 33,600
1.8	ROW Restoration	2.1	Mile	\$ -	\$ -	\$ 10,000	\$ 21,000	\$ 10,000	\$ 21,000
1.9	Work Pads	120,000.0	SF	\$ -	\$ -	\$ 4	\$ 422,400	\$ 4	\$ 422,400
1.10	Restoration for Work Pad areas	24,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 3,600	\$ 0	\$ 3,600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	1	EA	\$ -	\$ -	\$ 4,580	\$ 4,580	\$ 4,580	\$ 4,580
1.14	Maintenance and Protection of Traffic on Public Roads	2	EA	\$ -	\$ -	\$ 4,130	\$ 8,260	\$ 4,130	\$ 8,260
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	-	EA	\$ -	\$ -	\$ 1,850	\$ -	\$ 1,850	\$ -
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ -		\$ 1,404,512		\$ 1,404,512
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	6	EA	\$ 31,225	\$ 187,348	\$ 31,559	\$ 189,354	\$ 62,784	\$ 376,702
2.2	Direct Embed - 115kV Single Circuit H- Pole Tangent	18	EA	\$ 2,750	\$ 49,500	\$ 18,700	\$ 336,600	\$ 21,450	\$ 386,100
2.3	Rock Excavation Adder	200.0	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 236,848		\$ 925,954		\$ 1,162,802
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit H- Pole Angle/ DE	6	Structure	\$ 39,822	\$ 238,929	\$ 23,893	\$ 143,358	\$ 63,714	\$ 382,287
3.2	115kV Single Circuit H- Pole Tangent	18	Structure	\$ 18,515	\$ 333,266	\$ 11,109	\$ 199,960	\$ 29,624	\$ 533,226
3.3	Remove Existing Structure and Accessories	-	EA	\$ -	\$ -	\$ 7,500	\$ -	\$ 7,500	\$ -
3.4	Install Grounding and Grounding Accessories	27	EA	\$ -	\$ -	\$ 12,500	\$ 337,500	\$ 12,500	\$ 337,500
3.5									
3.6	Install Grounding and Grounding Accessories	48	Structure	\$ 506	\$ 24,288	\$ 5,539	\$ 265,848	\$ 6,045	\$ 290,136
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 596,484		\$ 946,665		\$ 1,543,149
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 3.53	\$ -	\$ 5.00	\$ -	\$ 8.53	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.55	\$ -	\$ 5.00	\$ -	\$ 6.55	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.72	\$ -	\$ 5.00	\$ -	\$ 5.72	\$ -
4.4	115kV - (1) 795kcmil 26/7 ACSR "Drake"	34,927.0	LF	\$ 1.72	\$ 60,074	\$ 5.00	\$ 174,635	\$ 6.72	\$ 234,709
4.5	(1) OPGW 36 Fiber AC-33/38/571	11,642.0	LF	\$ 1.35	\$ 15,717	\$ 5.00	\$ 58,210	\$ 6.35	\$ 73,927
4.6	(1) 3/8" EHS7 Steel	11,642.0	LF	\$ 0.47	\$ 5,472	\$ 5.00	\$ 58,210	\$ 5.47	\$ 63,682
4.7	Remove Existing Cable	2.1	Mile	\$ -	\$ -	\$ 30,000	\$ 63,600	\$ 30,000.00	\$ 63,600
4.8	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.9	Remove Existing EH7	2.1	Mile	\$ -	\$ -	\$ 12,000	\$ 25,440	\$ 12,000.00	\$ 25,440
4.10		-							
4.11		-							
4.12	Rider Poles (Locations)	2.0	EA	\$ 1,750	\$ 3,500	\$ 3,500	\$ 7,000	\$ 5,250.00	\$ 10,500
4.13									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 84,763		\$ 387,095		\$ 471,858
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	54	Assembly	\$ 900	\$ 48,600	\$ 360	\$ 19,440	\$ 1,260	\$ 68,040
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	36	Assembly	\$ 900	\$ 32,400	\$ 360	\$ 12,960	\$ 1,260	\$ 45,360
5.5					\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.7	OPGW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.8	OHSW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.9	OHSW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.10	OPGW Splice Boxes	2	Set	\$ 1,746	\$ 3,492	\$ 2,274	\$ 4,548	\$ 4,020	\$ 8,040
5.11	OPGW Splice & Test	2	EA	\$ 2,520	\$ 5,040	\$ 2,520	\$ 5,040	\$ 5,040	\$ 10,080
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	72	EA	\$ 35	\$ 2,520	\$ 35	\$ 2,520	\$ 70	\$ 5,040
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	25	EA	\$ 27	\$ 675	\$ 35	\$ 875	\$ 62	\$ 1,550
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	2.1	Mile	\$ 770	\$ 1,617	\$ 1,006	\$ 2,113	\$ 1,776	\$ 3,730
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 107,544		\$ 56,496		\$ 164,040

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>					\$ 1,025,639		\$ 3,720,722		\$ 4,746,361
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 295,076	\$ 295,076	\$ 295,076	\$ 295,076
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 237,318	\$ 237,318	\$ 237,318	\$ 237,318
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.7	Geotech	2	Location	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 33,225	\$ 33,225	\$ 33,225	\$ 33,225
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 153,000	\$ 153,000	\$ 153,000	\$ 153,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 82,051	\$ 82,051	\$ -	\$ -	\$ 82,051	\$ 82,051
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 4,746	\$ 4,746	\$ 4,746	\$ 4,746
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 82,051		\$ 921,234		\$ 1,003,285

**NextEra T022 (Segment B)**

**D. Knickerbocker 345kV Substation - Install**

Estimate Revision: **8** Total: \$ **19,118,107**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>D. Knickerbocker 345kV Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 223,675	\$ 1,936,115	\$ 2,159,790
2. SUBSTATION FOUNDATIONS	\$ 1,572,935	\$ 1,694,150	\$ 3,267,085
3. SUBSTATION STRUCTURES	\$ 727,975	\$ 727,975	\$ 1,455,950
4. MAJOR EQUIPMENT	\$ 600,000	\$ 240,000	\$ 840,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,086,500	\$ 489,500	\$ 1,576,000
6. CONTROL HOUSE / PANELS	\$ 1,837,125	\$ 1,227,625	\$ 3,064,750
7. MISC ITEMS	\$ 1,061,528	\$ 1,684,810	\$ 2,746,338
8. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 568,779	\$ 3,439,415	\$ 4,008,194
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 7,678,517</b>	<b>\$ 11,439,590</b>	<b>\$ 19,118,107</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 7,678,517</b>	<b>\$ 11,439,590</b>	<b>\$ 19,118,107</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Knickerbocker 345kV Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.875	ACRES	\$ -	\$ -	\$ 355,000	\$ 1,375,625	\$ 355,000	\$ 1,375,625
1.2	Station stone within substation fence.	1,650	CY	\$ 27	\$ 44,550	\$ 75	\$ 123,750	\$ 102	\$ 168,300
1.3	Substation Fence	1,660	LF	\$ 100	\$ 166,000	\$ 100	\$ 166,000	\$ 200	\$ 332,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide	275	LF	\$ 35	\$ 9,625	\$ 285	\$ 78,375	\$ 320	\$ 88,000
1.7	Pavement	3,373	SY	\$ -	\$ -	\$ 55	\$ 185,515	\$ 55	\$ 185,515
1.8	Gates	1	EA	\$ 2,000	\$ 2,000	\$ 2,500	\$ 2,500	\$ 4,500	\$ 4,500
1.9	Culverts / Misc. Access	2	EA	\$ 750	\$ 1,500	\$ 1,250	\$ 2,500	\$ 2,000	\$ 4,000
1.10	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 223,675		\$ 1,936,115		\$ 2,159,790
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	16	EA	\$ 26,145	\$ 418,320	\$ 28,000	\$ 448,000	\$ 54,145	\$ 866,320
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	72	EA	\$ 4,482	\$ 322,704	\$ 4,800	\$ 345,600	\$ 9,282	\$ 668,304
2.1f	Station Service Transformer Stand Foundation	4	EA	\$ 4,482	\$ 17,928	\$ 4,800	\$ 19,200	\$ 9,282	\$ 37,128
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	72	EA	\$ 4,482	\$ 322,704	\$ 4,800	\$ 345,600	\$ 9,282	\$ 668,304
2.1j	Instrument Transformer Stand Foundations	27	EA	\$ 4,482	\$ 121,014	\$ 4,800	\$ 129,600	\$ 9,282	\$ 250,614
2.1k	Arrester Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1m	Wave Trap Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p	Misc. Structure Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1q									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations		EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations		EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations		EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 44,260	\$ 44,260	\$ 47,400	\$ 47,400	\$ 91,660	\$ 91,660
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 9,750	\$ 9,750	\$ 9,750	\$ 9,750
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	5	EA	\$ 5,229	\$ 26,145	\$ 5,600	\$ 28,000	\$ 10,829	\$ 54,145
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,572,935		\$ 1,694,150		\$ 3,267,085
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1a	Substation A-Frame Structures - Stand alone	4	EA	\$ 37,000	\$ 148,000	\$ 37,000	\$ 148,000	\$ 74,000	\$ 296,000
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	12	EA	\$ 14,800	\$ 177,600	\$ 14,800	\$ 177,600	\$ 29,600	\$ 355,200
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	72	EA	\$ 3,700	\$ 266,400	\$ 3,700	\$ 266,400	\$ 7,400	\$ 532,800
3.1g	Instrument Transformer Stand	27	EA	\$ 1,850	\$ 49,950	\$ 1,850	\$ 49,950	\$ 3,700	\$ 99,900
3.1h	Arrester Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1j	Wave Trap Stand	3	EA	\$ 7,400	\$ 22,200	\$ 7,400	\$ 22,200	\$ 14,800	\$ 44,400
3.1k	Lightning Mast - 70'	5	EA	\$ 6,475	\$ 32,375	\$ 6,475	\$ 32,375	\$ 12,950	\$ 64,750
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 727,975	\$ 727,975		\$ 1,455,950	
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks with Reactors	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c									
4.1d									
4.1e									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 600,000		\$ 240,000		\$ 840,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	3	EA	\$ 40,000	\$ 120,000	\$ 15,000	\$ 45,000	\$ 55,000	\$ 165,000
5.1b	Disconnect Switches - 3ph w/ manual operator	6	EA	\$ 35,000	\$ 210,000	\$ 17,500	\$ 105,000	\$ 52,500	\$ 315,000
5.1c	VT'S	9	EA	\$ 25,000	\$ 225,000	\$ 12,000	\$ 108,000	\$ 37,000	\$ 333,000
5.1d	CT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1e	CCVT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,086,500		\$ 489,500		\$ 1,576,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 409,500	\$ 409,500	\$ 95,000	\$ 95,000	\$ 504,500	\$ 504,500
6.2	Protection and Telecom Equipment Panels	17	EA	\$ 35,000	\$ 595,000	\$ 10,000	\$ 170,000	\$ 45,000	\$ 765,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 317,625	\$ 317,625	\$ 317,625	\$ 317,625	\$ 635,250	\$ 635,250
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,837,125		\$ 1,227,625		\$ 3,064,750
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,050	LF	\$ 185.00	\$ 194,250	\$ 170.00	\$ 178,500	\$ 355	\$ 372,750
7.2	Rigid Bus, Fittings & Insulators	1,900	LF	\$ 125.07	\$ 237,633	\$ 237.10	\$ 450,490	\$ 362	\$ 688,123
7.3	Strain Bus, Connectors & Insulators	1,000	LF	\$ 39.30	\$ 39,300	\$ 53.35	\$ 53,350	\$ 93	\$ 92,650
7.4	Grounding System	16,500	LF	\$ 6.93	\$ 114,345	\$ 32.58	\$ 537,570	\$ 40	\$ 651,915
7.5	Strain Bus Insulators - 345kV	38	EA	\$ 2,000	\$ 76,000	\$ 1,050	\$ 39,900	\$ 3,050	\$ 115,900
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,061,528		\$ 1,684,810		\$ 2,746,338
<b>D. Knickerbocker 345kV Substation - Install</b>					\$ 7,109,738		\$ 8,000,175		\$ 15,109,913
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 151,099	\$ 151,099	\$ 151,099	\$ 151,099
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 939,368	\$ 939,368	\$ 939,368	\$ 939,368
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 151,099	\$ 151,099	\$ 151,099	\$ 151,099
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 151,099	\$ 151,099	\$ 151,099	\$ 151,099
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,208,793	\$ 1,208,793	\$ 1,208,793	\$ 1,208,793
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 105,769	\$ 105,769	\$ 105,769	\$ 105,769
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 377,748	\$ 377,748	\$ 377,748	\$ 377,748
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 45,330	\$ 45,330	\$ 45,330	\$ 45,330
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 280,000	\$ 280,000	\$ 280,000	\$ 280,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 568,779	\$ 568,779	\$ -	\$ -	\$ 568,779	\$ 568,779
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 15,110	\$ 15,110	\$ 15,110	\$ 15,110
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 568,779		\$ 3,439,415		\$ 4,008,194

**NextEra T022 (Segment B)**

**E. Greenbush Substation - Removal**

Estimate Revision: **8**

Total: \$ **72,410**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>E. Greenbush Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 12,000	\$ 12,000
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ 7,000	\$ 7,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 35,000	\$ 35,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 7,200	\$ 7,200
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 11,210	\$ 11,210
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 72,410	\$ 72,410
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 72,410	\$ 72,410

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>E. Greenbush Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 7,200	\$ 7,200	\$ 7,200	\$ 7,200
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	2	EA	\$ -	\$ -	\$ 2,400	\$ 4,800	\$ 2,400	\$ 4,800
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 12,000		\$ 12,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	1	EA	\$ -	\$ -	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 7,000		\$ 7,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	2	EA	\$ -	\$ -	\$ 17,500	\$ 35,000	\$ 17,500	\$ 35,000
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 35,000		\$ 35,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	2	EA	\$ -	\$ -	\$ 3,600	\$ 7,200	\$ 3,600	\$ 7,200
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 7,200		\$ 7,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	EA	\$ -	\$ -	\$ 126.25	\$ -	\$ 126	\$ -
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>E. Greenbush Substation - Removal</b>					\$ -		\$ 61,200		\$ 61,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,805	\$ 3,805	\$ 3,805	\$ 3,805
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 612	\$ 612	\$ 612	\$ 612
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 4,896	\$ 4,896	\$ 4,896	\$ 4,896
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 428	\$ 428	\$ 428	\$ 428
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 184	\$ 184	\$ 184	\$ 184
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ 280,000	\$ -	\$ 280,000	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17	Carrying Charges	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 61	\$ 61	\$ 61	\$ 61
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 11,210		\$ 11,210

**NextEra T022 (Segment B)**

**H. North Churchtown Substation - Install**

Estimate Revision: **8**

Total: \$ 18,595,643

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>H. North Churchtown Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 941,645	\$ 2,992,813	\$ 3,934,458
2. SUBSTATION FOUNDATIONS	\$ 1,001,293	\$ 1,078,700	\$ 2,079,993
3. SUBSTATION STRUCTURES	\$ 260,000	\$ 432,345	\$ 864,690
4. MAJOR EQUIPMENT	\$ 260,000	\$ 300,000	\$ 560,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,168,800	\$ 785,800	\$ 1,954,600
6. CONTROL HOUSE / PANELS	\$ 1,962,850	\$ 1,310,350	\$ 3,273,200
7. MISC ITEMS	\$ 972,988	\$ 1,257,365	\$ 2,230,353
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 539,194	\$ 3,159,155	\$ 3,698,349
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 7,106,770</b>	<b>\$ 11,316,528</b>	<b>\$ 18,595,643</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>TOTAL:</b>	<b>\$ 7,106,770</b>	<b>\$ 11,316,528</b>	<b>\$ 18,595,643</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. North Churchtown Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	2.125	ACRES	\$ -	\$ -	\$ 660,000	\$ 1,402,500	\$ 660,000	\$ 1,402,500
1.2	Station stone within substation fence.	1,000	CY	\$ 27	\$ 27,000	\$ 75	\$ 75,000	\$ 102	\$ 102,000
1.3	Substation Fence	1,100	LF	\$ 100	\$ 110,000	\$ 100	\$ 110,000	\$ 200	\$ 220,000
1.4	Permanent Access Road - 20'-Wide	740	LF	\$ 35	\$ 25,900	\$ 285	\$ 210,900	\$ 320	\$ 236,800
1.5	Retaining Wall (1035' x Avg. of 7.15')	1	LS	\$ 313,823	\$ 313,823	\$ 485,213	\$ 485,213	\$ 799,036	\$ 799,036
1.6	Compacted Fill (Sand)	27,143	CY	\$ 17	\$ 461,423	\$ 20	\$ 542,850	\$ 37	\$ 1,004,273
1.7									
1.8	Pavement	2,900	SY	\$ -	\$ -	\$ 55	\$ 159,500	\$ 55	\$ 159,500
1.9	Gates	1	EA	\$ 2,000	\$ 2,000	\$ 2,500	\$ 2,500	\$ 4,500	\$ 4,500
1.10	Culverts / Misc. Access	2	EA	\$ 750	\$ 1,500	\$ 1,250	\$ 2,500	\$ 2,000	\$ 4,000
1.11	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 941,645		\$ 2,992,813		\$ 3,934,458
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	5	EA	\$ 5,229	\$ 26,145	\$ 5,600	\$ 28,000	\$ 10,829	\$ 54,145
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	24	EA	\$ 16,434	\$ 394,416	\$ 17,600	\$ 422,400	\$ 34,034	\$ 816,816
2.3e	Switch Stand Foundations	28	EA	\$ 2,988	\$ 83,664	\$ 3,200	\$ 89,600	\$ 6,188	\$ 173,264
2.3f	Fuse Stand Foundations	2	EA	\$ 2,988	\$ 5,976	\$ 3,200	\$ 6,400	\$ 6,188	\$ 12,376
2.3g	Bus Support 3ph Foundations	14	EA	\$ 2,988	\$ 41,832	\$ 3,200	\$ 44,800	\$ 6,188	\$ 86,632
2.3h	Bus Support 1 Ph Foundations	15	EA	\$ 2,988	\$ 44,820	\$ 3,200	\$ 48,000	\$ 6,188	\$ 92,820
2.3j	Instrument Transformer Stand Foundations	45	EA	\$ 2,988	\$ 134,460	\$ 3,200	\$ 144,000	\$ 6,188	\$ 278,460
2.3k	Arrester Stand Foundations	15	EA	\$ 2,988	\$ 44,820	\$ 3,200	\$ 48,000	\$ 6,188	\$ 92,820
2.3m	Wave Trap Stand Foundations	10	EA	\$ 2,988	\$ 29,880	\$ 3,200	\$ 32,000	\$ 6,188	\$ 61,880
2.3n	Station Service Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 33,615	\$ 33,615	\$ 36,000	\$ 36,000	\$ 69,615	\$ 69,615
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 1ph.	1	LS	\$ -	\$ -	\$ 6,500	\$ 6,500	\$ 6,500	\$ 6,500
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,001,293		\$ 1,078,700		\$ 2,079,993
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ 1,078,700	\$ -	\$ 1,078,700	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	8	EA	\$ 18,500	\$ 148,000	\$ 18,500	\$ 148,000	\$ 37,000	\$ 296,000
3.3c	Switch Stands	14	EA	\$ 7,955	\$ 111,370	\$ 7,955	\$ 111,370	\$ 15,910	\$ 222,740
3.3d	Fuse Stand	1	EA	\$ 7,955	\$ 7,955	\$ 7,955	\$ 7,955	\$ 15,910	\$ 15,910
3.3e	Bus Support 3ph	7	EA	\$ 3,330	\$ 23,310	\$ 3,330	\$ 23,310	\$ 6,660	\$ 46,620
3.3f	Bus Support 1 Ph	15	EA	\$ 1,850	\$ 27,750	\$ 1,850	\$ 27,750	\$ 3,700	\$ 55,500
3.3g	Instrument Transformer Stand	45	EA	\$ 740	\$ 33,300	\$ 740	\$ 33,300	\$ 1,480	\$ 66,600
3.3h	Arrester Stand	15	EA	\$ 740	\$ 11,100	\$ 740	\$ 11,100	\$ 1,480	\$ 22,200
3.3j	Wave Trap Stand	5	EA	\$ 3,700	\$ 18,500	\$ 3,700	\$ 18,500	\$ 7,400	\$ 37,000
3.3k	Lightning Mast	2	EA	\$ 6,475	\$ 12,950	\$ 6,475	\$ 12,950	\$ 12,950	\$ 25,900
3.3l	Station Service Transformer Support Stand	1	EA	\$ 1,110	\$ 1,110	\$ 1,110	\$ 1,110	\$ 2,220	\$ 2,220
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 432,345		\$ 432,345		\$ 864,690
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200,000	\$ -	\$ 80,000	\$ -	\$ 280,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	5	EA	\$ 52,000	\$ 260,000	\$ 60,000	\$ 300,000	\$ 112,000	\$ 560,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 260,000		\$ 300,000		\$ 560,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	5	EA	\$ 33,000	\$ 165,000	\$ 15,000	\$ 75,000	\$ 48,000	\$ 240,000
5.3b	Disconnect Switches - 3ph w/ manual operator	10	EA	\$ 28,000	\$ 280,000	\$ 17,500	\$ 175,000	\$ 45,500	\$ 455,000
5.3c	VT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3d	CT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3e	CCVT'S	15	EA	\$ 8,000	\$ 120,000	\$ 8,000	\$ 120,000	\$ 16,000	\$ 240,000
5.3f	Arresters	15	EA	\$ 3,420	\$ 51,300	\$ 6,000	\$ 90,000	\$ 9,420	\$ 141,300
5.3g	Wave Traps	5	EA	\$ 13,000	\$ 65,000	\$ 8,000	\$ 40,000	\$ 21,000	\$ 105,000
5.3h	Station Service Transformers	1	EA	\$ 75,000	\$ 75,000	\$ 35,000	\$ 35,000	\$ 110,000	\$ 110,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	3	EA	\$ 7,500	\$ 22,500	\$ 3,600	\$ 10,800	\$ 11,100	\$ 33,300
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,168,800		\$ 785,800		\$ 1,954,600
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 292,500	\$ 292,500	\$ 85,000	\$ 85,000	\$ 377,500	\$ 377,500
6.2	Protection and Telecom Equipment Panels	23	EA	\$ 35,000	\$ 805,000	\$ 10,000	\$ 230,000	\$ 45,000	\$ 1,035,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 350,350	\$ 350,350	\$ 350,350	\$ 350,350	\$ 700,700	\$ 700,700
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,962,850		\$ 1,310,350		\$ 3,273,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,500.0	LF	\$ 185.00	\$ 277,500	\$ 170.00	\$ 255,000	\$ 355	\$ 532,500
7.2	Rigid Bus, Fittings & Insulators	900.0	LF	\$ 125.07	\$ 112,563	\$ 237.10	\$ 213,390	\$ 362	\$ 325,953
7.3	Strain Bus, Connectors & Insulators	1,500.0	LF	\$ 39.30	\$ 58,950	\$ 53.35	\$ 80,025	\$ 93	\$ 138,975
7.4	Grounding System	7,500.0	LF	\$ 6.93	\$ 51,975	\$ 32.58	\$ 244,350	\$ 40	\$ 296,325
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	72	EA	\$ 1,000	\$ 72,000	\$ 550	\$ 39,600	\$ 1,550	\$ 111,600
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 972,988		\$ 1,257,365		\$ 2,230,353
<b>H. North Churchtown Substation - Install</b>					\$ 6,739,921		\$ 8,157,373		\$ 14,897,294
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 148,973	\$ 148,973	\$ 148,973	\$ 148,973
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 926,150	\$ 926,150	\$ 926,150	\$ 926,150
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 148,973	\$ 148,973	\$ 148,973	\$ 148,973
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 148,973	\$ 148,973	\$ 148,973	\$ 148,973
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,191,784	\$ 1,191,784	\$ 1,191,784	\$ 1,191,784
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 104,281	\$ 104,281	\$ 104,281	\$ 104,281

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 372,432	\$ 372,432	\$ 372,432	\$ 372,432
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 44,692	\$ 44,692	\$ 44,692	\$ 44,692
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 44,000	\$ 44,000	\$ 44,000	\$ 44,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17	Carrying Charges	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 539,194	\$ 539,194	\$ -	\$ -	\$ 539,194	\$ 539,194
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 14,897	\$ 14,897	\$ 14,897	\$ 14,897
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 539,194		\$ 3,159,155		\$ 3,698,349

**NextEra T022 (Segment B)**

**J. Pleasant Valley Substation - Install**

Estimate Revision: **8**

Total: \$ **3,526,235**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>J. Pleasant Valley Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 11,025	\$ 14,625	\$ 25,650
2. SUBSTATION FOUNDATIONS	\$ 161,177	\$ 171,300	\$ 332,477
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 260,500	\$ 129,000	\$ 389,500
6. CONTROL HOUSE / PANELS	\$ 560,900	\$ 253,400	\$ 814,300
7. MISC ITEMS	\$ 409,950	\$ 457,275	\$ 867,225
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 131,836	\$ 596,447	\$ 728,283
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,779,788	\$ 1,746,447	\$ 3,526,235
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,779,788	\$ 1,746,447	\$ 3,526,235

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Pleasant Valley Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 230,000	\$ -	\$ 230,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	90	LF	\$ 100	\$ 9,000	\$ 100	\$ 9,000	\$ 200	\$ 18,000
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 11,025		\$ 14,625		\$ 25,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p									
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House Addition Foundation (25-ft x 50-ft)	1	EA	\$ 61,079	\$ 61,079	\$ 64,100	\$ 64,100	\$ 125,179	\$ 125,179
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 161,177		\$ 171,300		\$ 332,477
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks - W/ Center Tap VT and Reactors	0	EA	\$ 370,000	\$ -	\$ 80,000	\$ -	\$ 450,000	\$ -
4.1c	Circuit Breakers - Cap Switching	0	EA	\$ 220,000	\$ -	\$ 750,000	\$ -	\$ 970,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 8,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 260,500		\$ 129,000		\$ 389,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE Addition (25-ft x 50-ft)	1	EA	\$ 325,000	\$ 325,000	\$ 85,000	\$ 85,000	\$ 410,000	\$ 410,000
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 12,500	\$ 37,500	\$ 47,500	\$ 142,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 130,900	\$ 130,900	\$ 130,900	\$ 130,900	\$ 261,800	\$ 261,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 560,900		\$ 253,400		\$ 814,300
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	LF	\$ 125.07	\$ -	\$ 237.10	\$ -	\$ 362	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 13.38	\$ 33,450	\$ 39.35	\$ 98,375	\$ 53	\$ 131,825
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	38	EA	\$ 2,000	\$ 76,000	\$ 1,050	\$ 39,900	\$ 3,050	\$ 115,900
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 62,500	\$ 62,500	\$ 75,000	\$ 75,000	\$ 137,500	\$ 137,500
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 90,000	\$ 90,000	\$ 108,000	\$ 108,000	\$ 198,000	\$ 198,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 409,950		\$ 457,275		\$ 867,225
<b>J. Pleasant Valley Substation - Install</b>					\$ 1,647,952		\$ 1,150,000		\$ 2,797,952
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 173,946	\$ 173,946	\$ 173,946	\$ 173,946
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 223,836	\$ 223,836	\$ 223,836	\$ 223,836
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 19,586	\$ 19,586	\$ 19,586	\$ 19,586
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 69,949	\$ 69,949	\$ 69,949	\$ 69,949
<b>Permitting and Additional Costs</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 8,394	\$ 8,394	\$ 8,394	\$ 8,394
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17	Carrying Charges	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 131,836	\$ 131,836	\$ -	\$ -	\$ 131,836	\$ 131,836
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,798	\$ 2,798	\$ 2,798	\$ 2,798
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 131,836	\$ -	\$ 596,447	\$ -	\$ 728,283

**NextEra T022 (Segment B)**

**Interconnection Knickerbocker Station**

Estimate Revision: **8**

**Total: \$ 1,826,890**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>L. Interconnection Knickerbocker Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 436,850	\$ 436,850
2. FOUNDATIONS	\$ 238,638	\$ 241,194	\$ 479,832
3. STRUCTURES	\$ 313,836	\$ 219,711	\$ 533,547
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 58,150	\$ 26,466	\$ 84,616
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 48,850	\$ 243,195	\$ 292,045
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 659,474</b>	<b>\$ 1,167,416</b>	<b>\$ 1,826,890</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 659,474</b>	<b>\$ 1,167,416</b>	<b>\$ 1,826,890</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Knickerbocker Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	35,000.0	SF	\$ -	\$ -	\$ 4	\$ 123,200	\$ 4	\$ 123,200
1.10	Restoration for Work Pad areas	7,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,050	\$ 0	\$ 1,050
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 436,850		\$ 436,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV THREE POLE TAP, STEEL	2	Structures	\$ 119,319	\$ 238,638	\$ 120,597	\$ 241,194	\$ 239,916	\$ 479,832
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 238,638		\$ 241,194		\$ 479,832
<b>3. STRUCTURES</b>									
3.1	345KV THREE POLE TAP, STEEL	2	Structure	\$ 155,400	\$ 310,800	\$ 93,240	\$ 186,480	\$ 248,640	\$ 497,280
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	6	Pole	\$ 506	\$ 3,036	\$ 5,539	\$ 33,231	\$ 6,045	\$ 36,267
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 313,836		\$ 219,711		\$ 533,547
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 1.033kcmil 54/7 ACSS "Curlew"	-	LF	\$ 2.82	\$ -	\$ 5.00	\$ -	\$ 7.82	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	30	Assembly	\$ 1,800	\$ 54,000	\$ 720	\$ 21,600	\$ 2,520	\$ 75,600
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.7	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.8	OHSW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.9	OPGW Splice Boxes	1	Set	\$ 1,750	\$ 1,750	\$ 1,746	\$ 1,746	\$ 3,496	\$ 3,496
5.10	OPGW Splice & Test	1	EA	\$ 1,400	\$ 1,400	\$ 2,520	\$ 2,520	\$ 3,920	\$ 3,920
5.11	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.12	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.16									
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 58,150		\$ 26,466		\$ 84,616
<b>L. Interconnection Knickerbocker Station</b>					\$ 610,624		\$ 924,221		\$ 1,534,845
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 15,348	\$ 15,348	\$ 15,348	\$ 15,348
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 95,420	\$ 95,420	\$ 95,420	\$ 95,420
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 15,348	\$ 15,348	\$ 15,348	\$ 15,348
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 15,348	\$ 15,348	\$ 15,348	\$ 15,348
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 76,742	\$ 76,742	\$ 76,742	\$ 76,742
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 4,605	\$ 4,605	\$ 4,605	\$ 4,605
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 10,744	\$ 10,744	\$ 10,744	\$ 10,744
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 40,000	\$ -	\$ 40,000	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 4,605	\$ 4,605	\$ 4,605	\$ 4,605
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Carrying Charges	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 48,850	\$ 48,850	\$ -	\$ -	\$ 48,850	\$ 48,850
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 1,535	\$ 1,535	\$ 1,535	\$ 1,535
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 48,850		\$ 243,195		\$ 292,045

**NextEra T022 (Segment B)**

**M. Interconnection Churchtown Station**

Estimate  
Revision: **8**

**Total: \$ 5,486,886**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>M. Interconnection Churchtown Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 712,850	\$ 712,850
2. FOUNDATIONS	\$ 861,128	\$ 1,284,831	\$ 2,145,960
3. STRUCTURES	\$ 570,674	\$ 498,922	\$ 1,069,596
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 481,350	\$ 200,586	\$ 681,936
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 153,052	\$ 723,492	\$ 876,545
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 2,066,205</b>	<b>\$ 3,420,681</b>	<b>\$ 5,486,886</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 2,066,205</b>	<b>\$ 3,420,681</b>	<b>\$ 5,486,886</b>

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Churchtown Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	1,425.0	LF	\$ -	\$ -	\$ 70	\$ 99,750	\$ 70	\$ 99,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	95,000.0	SF	\$ -	\$ -	\$ 4	\$ 334,400	\$ 4	\$ 334,400
1.10	Restoration for Work Pad areas	19,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 2,850	\$ 0	\$ 2,850
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>				\$ -	\$ -	\$ 712,850	\$ 712,850	\$ -	\$ 712,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV S/C DEADEND, STEEL	17	Structures	\$ 50,485	\$ 858,249	\$ 51,026	\$ 867,441	\$ 101,511	\$ 1,725,690
2.2	Direct Embed - 115KV DELTA S/C TANGENT, CONCRETE	2	Structures	\$ 1,440	\$ 2,879	\$ 8,695	\$ 17,391	\$ 10,135	\$ 20,270
2.3									
2.4									
2.5	Rock Excavation Adder	200	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 861,128		\$ 1,284,831		\$ 2,145,960
<b>3. STRUCTURES</b>									
3.1	345KV S/C DEADEND, STEEL	17	Structure	\$ 31,450	\$ 534,650	\$ 18,870	\$ 320,790	\$ 50,320	\$ 855,440
3.2	115KV DELTA S/C TANGENT, CONCRETE	2	Structure	\$ 13,205	\$ 26,410	\$ 36,450	\$ 72,900	\$ 49,655	\$ 99,310
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	19	Pole	\$ 506	\$ 9,614	\$ 5,539	\$ 105,232	\$ 6,045	\$ 114,846
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 570,674		\$ 498,922		\$ 1,069,596
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kv Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kv - (1) 795kcmil 26/7 ACSS "Drake"	-	LF	\$ 1.72	\$ -	\$ 5.00	\$ -	\$ 6.72	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	12	Assembly	\$ 900	\$ 10,800	\$ 560	\$ 6,720	\$ 1,460	\$ 17,520
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	255	Assembly	\$ 1,800	\$ 459,000	\$ 720	\$ 183,600	\$ 2,520	\$ 642,600
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	16	Assembly	\$ 200	\$ 3,200	\$ 150	\$ 2,400	\$ 350	\$ 5,600
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Tangent	16	Assembly	\$ 200	\$ 3,200	\$ 150	\$ 2,400	\$ 350	\$ 5,600
5.8	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.9	OPGW Splice Boxes	1	Set	\$ 1,750	\$ 1,750	\$ 1,746	\$ 1,746	\$ 3,496	\$ 3,496
5.10	OPGW Splice & Test	1	EA	\$ 1,400	\$ 1,400	\$ 2,520	\$ 2,520	\$ 3,920	\$ 3,920
5.11	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.12	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.16					\$ -		\$ -		\$ -
5.17					\$ -		\$ -		\$ -
5.18					\$ -		\$ -		\$ -
5.19					\$ -		\$ -		\$ -
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 481,350		\$ 200,586		\$ 681,936

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Churchtown Station</b>					\$ 1,913,152		\$ 2,697,189		\$ 4,610,341
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 46,103	\$ 46,103	\$ 46,103	\$ 46,103
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 286,620	\$ 286,620	\$ 286,620	\$ 286,620
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 46,103	\$ 46,103	\$ 46,103	\$ 46,103
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 46,103	\$ 46,103	\$ 46,103	\$ 46,103
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 230,517	\$ 230,517	\$ 230,517	\$ 230,517
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 13,831	\$ 13,831	\$ 13,831	\$ 13,831
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 32,272	\$ 32,272	\$ 32,272	\$ 32,272
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 40,000	\$ -	\$ 40,000	\$ -
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 13,831	\$ 13,831	\$ 13,831	\$ 13,831
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Carrying Charges	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 153,052	\$ 153,052	\$ -	\$ -	\$ 153,052	\$ 153,052
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 4,610	\$ 4,610	\$ 4,610	\$ 4,610
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 153,052		\$ 723,492		\$ 876,545

**NextEra T022 (Segment B)**

**N. Interconnection Milan Station**

Estimate Revision: **8** Total: \$ **745,080**

NextEra T022 (Segment B)			
	Supply	Installation	Total
<b>N. Interconnection Milan Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 121,100	\$ 121,100
2. FOUNDATIONS	\$ 84,375	\$ 135,279	\$ 219,654
3. STRUCTURES	\$ 130,328	\$ 88,667	\$ 218,994
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 45,200	\$ 18,480	\$ 63,680
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 20,792	\$ 100,860	\$ 121,652
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
SUBTOTAL:	\$ 280,695	\$ 464,385	\$ 745,080
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
TOTAL:	\$ 280,695	\$ 464,385	\$ 745,080

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Milan Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	1.0	Acre	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	500.0	LF	\$ -	\$ -	\$ 4	\$ 2,000	\$ 4	\$ 2,000
1.5	Matting - Access and ROW	500.0	LF	\$ -	\$ -	\$ 70	\$ 35,000	\$ 70	\$ 35,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	10,000.0	SF	\$ -	\$ -	\$ 4	\$ 35,200	\$ 4	\$ 35,200
1.10	Restoration for Work Pad areas	2,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 300	\$ 0	\$ 300
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 121,100		\$ 121,100
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit Single Pole Angle/DE	2	EA	\$ 42,187	\$ 84,375	\$ 42,639	\$ 85,279	\$ 84,827	\$ 169,654
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	25	CY	\$ -	\$ -	\$ 2,000	\$ 50,000	\$ 2,000	\$ 50,000
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 84,375		\$ 135,279		\$ 219,654
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	2	Structure	\$ 64,658	\$ 129,316	\$ 38,795	\$ 77,590	\$ 103,453	\$ 206,905
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	2	Pole	\$ 506	\$ 1,012	\$ 5,539	\$ 11,077	\$ 6,045	\$ 12,089
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 130,328		\$ 88,667		\$ 218,994
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	24	Assembly	\$ 1,800	\$ 43,200	\$ 720	\$ 17,280	\$ 2,520	\$ 60,480
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5		-	Assembly			\$ 360			\$ -
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 45,200		\$ 18,480		\$ 63,680
<b>N. Interconnection Milan Station</b>					\$ 259,903		\$ 363,525		\$ 623,428
<b>6. MOB/DEMOb, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 6,234	\$ 6,234	\$ 6,234	\$ 6,234
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 38,758	\$ 38,758	\$ 38,758	\$ 38,758
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 6,234	\$ 6,234	\$ 6,234	\$ 6,234
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 6,234	\$ 6,234	\$ 6,234	\$ 6,234
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 31,171	\$ 31,171	\$ 31,171	\$ 31,171
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 1,870	\$ 1,870	\$ 1,870	\$ 1,870
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 4,364	\$ 4,364	\$ 4,364	\$ 4,364
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,870	\$ 1,870	\$ 1,870	\$ 1,870
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Carrying Charges	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 20,792	\$ 20,792	\$ -	\$ -	\$ 20,792	\$ 20,792
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 623	\$ 623	\$ 623	\$ 623
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 20,792		\$ 100,860		\$ 121,652

**NextEra - T022 - (Segment B)**

**O. NUF to mitigate NY to NE interface transfer limit degradation**

Estimate  
Revision: **8**

**Total: \$ 26,785,714**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>SUF 1</b>	<b>Transmission Line Upgrade Cricket Valley - Connecticut Border to Long Mountain</b>								
1.1	Line Upgrade	1.00	LS		\$ -		\$ -	\$ 21,428,571	\$ 21,428,571
	<b>Subtotal SUG 1 Direct Cost</b>				\$ -		\$ -		\$ 21,428,571
2	Engineering, T&C, PM, Indirects (25%)				\$ -		\$ -		\$ 5,357,143
	<b>TOTAL:</b>				\$ -		\$ -		\$ 26,785,714

**NextEra T022 (Segment B)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type. 20% of the total length of the line is assumed to use Type 1 Gravel road and 80% of the line length access to be used wood matting. In addition 75 feet of wood matting is included from the access matting to the work pad area matting. The estimate also include 5,000 square feet of wood matting for each structure work area within the ROW. For the ground restoration (seed, straw and woven mat), 20% of the work pad area included.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 5.406% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	From Churchtown to Pleasant Valley only one line of Lattice Structures is to be removed.
25	From Churchtown to Pleasant Valley; Churchtown loop around 345kV conductor 0.3 miles have been added.
26	An additional Quantity of 5% have been added to conductors, OPGW, & OHSW for sag and jumpers.
27	Rock excavation not provided in proposal foundation data, most of the foundation are concrete pole direct embedded, rock excavation assumed 50% for T022 (Churchtown to Pleasant Valley) and rest 75% of quantities of National Grid's proposal.
28	Cricket Valley to Long Mountain line upgrade: Network Upgrade (NUF) costs to mitigate NY to NE interface transfer limit degradation were based on possible solutions identified during the June 2018 SIS process
29	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.



NextEra Energy (T023)			
Description		Total Amount (In thousand \$)	
Direct Cost	1	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$34,215
	1.2	Foundations	\$21,257
	1.3	Structures	\$67,904
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$30,529
	1.5	Insulators, Fitting and Hardwares	\$11,349
	Subtotal (1)		<b>\$165,255</b>
	2	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$15,110
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$0
	2.4	Churchtown Substation	\$13,040
	2.5	Pleasant Valley Substation	\$2,798
	2.6	Substation Interconnections	\$6,473
Subtotal (2)		<b>\$37,482</b>	
Total (1+2)		\$202,736	
Contractors Mark-up (15% of Total 1+2)		\$30,410	
Total Direct Cost (A)		<b>\$233,147</b>	
Indirect Cost	3	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,027
	3.2	Project Management, Material Handling & Amenities	\$16,697
	3.3	Engineering	\$13,253
	3.4	Testing & Commissioning	\$874
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$12,954
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
Total Indirect Cost (3)		<b>\$53,433</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$286,580</b>	
4	<b>Network Upgrade Facilities (NUF)</b>		
	4.1	NUF proposed as element of the Project	\$0
	4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000
Subtotal NUF Cost (C)		<b>\$30,000</b>	
Total Project Cost (B+C) 2017 \$		<b>\$316,580</b>	
Total Project Cost 2018 \$		<b>\$326,077</b>	

**NextEra T023 (Segment B Alternate)**

Estimate Revision: 8

<i>NextEra T023 (Segment B Alternate) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 59,787,815
Direct Labor, Material & Equipment Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 100,720,518
Direct Labor, Material & Equipment Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 4,746,361
Direct Labor, Material & Equipment Costs	D. Knickerbocker 345kV Substation - Install	\$ 15,109,913
Direct Labor, Material & Equipment Costs	E.	\$ -
Direct Labor, Material & Equipment Costs	F.	\$ -
Direct Labor, Material & Equipment Costs	G.	\$ -
Direct Labor, Material & Equipment Costs	H. North Churchtown Substation - Install	\$ 13,039,784
Direct Labor, Material & Equipment Costs	I. Greenbush Substation - Removal	\$ 61,200
Direct Labor, Material & Equipment Costs	J. Pleasant Valley Substation - Install	\$ 2,797,952
Direct Labor, Material & Equipment Costs	K.	\$ -
Direct Labor, Material & Equipment Costs	L. Interconnection Knickerbocker Station	\$ 1,534,845
Direct Labor, Material & Equipment Costs	M. Interconnection Churchtown Station	\$ 4,339,656
Direct Labor, Material & Equipment Costs	N. Interconnection Milan Station	\$ 598,228
Direct Labor, Material & Equipment Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 21,428,571
Direct Labor, Material & Equipment Costs	P. NUF proposed as element of the Project	\$ -
<b>SUBTOTAL:</b>		\$ 224,164,843
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		\$ 33,624,726
<b>CONTINGENCY ON ENTIRE PROJECT</b>		\$ -
<b>TOTAL DIRECT:</b>		\$ 257,789,569

<i>NextEra T023 (Segment B Alternate) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 13,640,683
Indirect Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 21,913,317
Indirect Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 1,004,213
Indirect Costs	D. Knickerbocker 345kV Substation - Install	\$ 4,011,148
Indirect Costs	E.	\$ -
Indirect Costs	F.	\$ -
Indirect Costs	G.	\$ -
Indirect Costs	H. North Churchtown Substation - Install	\$ 3,246,034
Indirect Costs	I. Greenbush Substation - Removal	\$ 9,439
Indirect Costs	J. Pleasant Valley Substation - Install	\$ 728,830
Indirect Costs	K. Pleasant Valley Substation - Removal	\$ -
Indirect Costs	L. Interconnection Knickerbocker Station	\$ 292,345
Indirect Costs	M. Interconnection Churchtown Station	\$ 843,122
Indirect Costs	N. Interconnection Milan Station	\$ 116,394
Indirect Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 5,357,143
Indirect Costs	P. NUF proposed as element of the Project	\$ -
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lisc. & Permit., and Envir. Mitigation)	\$ 7,627,609
<b>TOTAL INDIRECT:</b>		\$ 58,790,277

**TOTAL ESTIMATED COST: \$ 316,579,846**

**NextEra T023 (Segment B Alternate)**

**A. Transmission Line Knickerbocker to Churchtown**

Estimate Revision: **8**

Total: \$ 73,428,499

NextEra T023 (Segment B Alternate)			
	Supply	Installation	Total
<b>A. Transmission Line Knickerbocker to Churchtown</b>			
1. CLEARING & ACCESS	\$ 11,500	\$ 13,208,953	\$ 13,220,453
2. FOUNDATIONS	\$ 1,519,868	\$ 4,432,528	\$ 5,952,396
3. STRUCTURES	\$ 4,990,679	\$ 19,604,107	\$ 24,594,786
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,943,787	\$ 8,681,855	\$ 11,625,642
5. INSULATORS, FITTINGS, HARDWARE	\$ 2,896,560	\$ 1,497,978	\$ 4,394,539
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 988,992	\$ 12,651,692	\$ 13,640,683
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 13,351,386</b>	<b>\$ 60,077,113</b>	<b>\$ 73,428,499</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 13,351,386</b>	<b>\$ 60,077,113</b>	<b>\$ 73,428,499</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Knickerbocker to Churchtown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	19.0	Acre	\$ -	\$ -	\$ 15,000	\$ 285,000	\$ 15,000	\$ 285,000
1.2	Clearing the ROW - Light (mowing)	61.0	Acre		\$ -	\$ 5,000	\$ 305,000	\$ 5,000	\$ 305,000
1.3	Permanent Access Road	23,126	LF	\$ -	\$ -	\$ 45.00	\$ 1,040,688	\$ 45	\$ 1,040,688
1.4	Silt Fence	115,632	LF	\$ -	\$ -	\$ 4.00	\$ 462,528	\$ 4	\$ 462,528
1.5	Matting - Access and ROW	92,506	LF	\$ -	\$ -	\$ 70.00	\$ 6,475,392	\$ 70	\$ 6,475,392
1.6	Matting - To Work Area	11,925	LF	\$ -	\$ -	\$ 70.00	\$ 834,750	\$ 70	\$ 834,750
1.7	Snow Removal	21.9	Mile	\$ -	\$ -	\$ 16,000	\$ 350,400	\$ 16,000	\$ 350,400
1.8	ROW Restoration	21.9	Mile	\$ -	\$ -	\$ 10,000	\$ 219,000	\$ 10,000	\$ 219,000
1.9	Work Pads	795,000	SF	\$ -	\$ -	\$ 3.52	\$ 2,798,400	\$ 4	\$ 2,798,400
1.10	Restoration for Work Pad areas	159,000	SF	\$ -	\$ -	\$ 0.15	\$ 23,850	\$ 0	\$ 23,850
1.11	Temporary Access Bridge	9	EA	\$ -	\$ -	\$ 20,035	\$ 180,315	\$ 20,035	\$ 180,315
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	4	EA	\$ -	\$ -	\$ 4,580	\$ 18,320	\$ 4,580	\$ 18,320
1.14	Maintenance and Protection of Traffic on Public Roads	47	EA	\$ -	\$ -	\$ 4,130	\$ 194,110	\$ 4,130	\$ 194,110
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	2	EA	\$ 2,000	\$ 4,000	\$ 2,500	\$ 5,000	\$ 4,500	\$ 9,000
1.17	Concrete Washout Station	2	EA	\$ -	\$ -	\$ 1,850	\$ 3,700	\$ 1,850	\$ 3,700
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 11,500		\$ 13,208,953		\$ 13,220,453
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115/345KV D/C DEADEND, STEEL	13	EA	\$ 86,969	\$ 1,130,593	\$ 87,900	\$ 1,142,702	\$ 174,869	\$ 2,273,295
2.2	Drilled Pier - 345KV S/C DEADEND, STEEL	1	EA	\$ 39,770	\$ 39,770	\$ 40,196	\$ 40,196	\$ 79,966	\$ 79,966
2.3	Direct Embed - 115/345KV D/C TANGENT, CONCRETE	145	EA	\$ 2,410	\$ 349,504	\$ 16,391	\$ 2,376,630	\$ 18,801	\$ 2,726,134
2.4	Rock Excavation Adder	436.5	CY	\$ -	\$ -	\$ 2,000	\$ 873,000	\$ 2,000	\$ 873,000
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.13									
2.14									
2.15									
2.16									
2.17									
2.18									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,519,868		\$ 4,432,528		\$ 5,952,396
<b>3. STRUCTURES</b>									
3.1	115/345KV D/C DEADEND, STEEL	13	Structure	\$ 131,581	\$ 1,710,556	\$ 78,949	\$ 1,026,334	\$ 210,530	\$ 2,736,890
3.2	345KV S/C DEADEND, STEEL	1	Structure	\$ 51,800	\$ 51,800	\$ 31,080	\$ 31,080	\$ 82,880	\$ 82,880
3.3	115/345KV D/C TANGENT, CONCRETE	145	Structure	\$ 21,709	\$ 3,147,869	\$ 91,587	\$ 13,280,072	\$ 113,296	\$ 16,427,940
3.4	Remove Existing Foundation	688	EA	\$ -	\$ -	\$ 3,250	\$ 2,236,000	\$ 3,250	\$ 2,236,000
3.5	Remove Existing Structure and Accessories	172	EA	\$ -	\$ -	\$ 12,500	\$ 2,150,000	\$ 12,500	\$ 2,150,000
3.6	Install Grounding and Grounding Accessories	159	Pole	\$ 506	\$ 80,454	\$ 5,539	\$ 880,622	\$ 6,045	\$ 961,076
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 4,990,679		\$ 19,604,107		\$ 24,594,786
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 1,033kcmil 54/7 ACSS "Curlew"	728,482	LF	\$ 2.82	\$ 2,054,319	\$ 5.00	\$ 3,642,410	\$ 7.82	\$ 5,696,729
4.2	(1) OPGW 36 Fiber AC-33/38/571	121,414	LF	\$ 1.35	\$ 163,909	\$ 5.00	\$ 607,070	\$ 6.35	\$ 770,979
4.3	(1) 3/8" EHS7 Steel	121,414	LF	\$ 0.47	\$ 57,065	\$ 5.00	\$ 607,070	\$ 5.47	\$ 664,135
4.4	Remove Existing Cable From Existing Structures	43.8	Mile	\$ -	\$ -	\$ 30,000	\$ 1,314,000	\$ 30,000.00	\$ 1,314,000
4.5	Remove Existing OPGW Cable and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.6	Remove Existing OHSW and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.7	115kv - (1) 795kcmil 26/7 ACSS "Drake"	364,241	LF	\$ 1.72	\$ 626,495	\$ 5.00	\$ 1,821,205	\$ 6.72	\$ 2,447,700
4.8	Rider Poles (47 Locations)	24	Set	\$ 1,750	\$ 42,000	\$ 3,500	\$ 84,000	\$ 5,250.00	\$ 126,000
4.9	Rider Poles - Relocated	23	Set	\$ -	\$ -	\$ 3,500	\$ 80,500	\$ 3,500.00	\$ 80,500
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,943,787		\$ 8,681,855		\$ 11,625,642
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	725	Assembly	\$ 1,800	\$ 1,305,000	\$ 720	\$ 522,000	\$ 2,520	\$ 1,827,000
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	870	Assembly	\$ 900	\$ 783,000	\$ 560	\$ 487,200	\$ 1,460	\$ 1,270,200
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	210	Assembly	\$ 1,800	\$ 378,000	\$ 720	\$ 151,200	\$ 2,520	\$ 529,200
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	91	Assembly	\$ 900	\$ 81,900	\$ 560	\$ 50,960	\$ 1,460	\$ 132,860
5.5				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.8	OPGW Assembly - Tangent	145	Assembly	\$ 200	\$ 29,000	\$ 150	\$ 21,750	\$ 350	\$ 50,750
5.9	OPGW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
5.10	OHSW Assembly - Tangent	145	Assembly	\$ 200	\$ 29,000	\$ 150	\$ 21,750	\$ 350	\$ 50,750
5.11	OHSW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.12	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.13	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.14	Spacer - Conductor	3,659	EA	\$ 50	\$ 182,950	\$ 35	\$ 128,065	\$ 85	\$ 311,015
5.15	Vibration Dampers - Conductor	878	EA	\$ 35	\$ 30,730	\$ 35	\$ 30,730	\$ 70	\$ 61,460
5.16	Shield wire / OPGW Dampers, Misc. Fittings	444	EA	\$ 27	\$ 11,988	\$ 35	\$ 15,540	\$ 62	\$ 27,528
5.17									
5.18									
5.19									
5.20									
5.21	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.22	Misc. materials (Signs and Markers)	21.9	Mile	\$ 770	\$ 16,863	\$ 1,006	\$ 22,031	\$ 1,776	\$ 38,894
5.23		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 2,896,560		\$ 1,497,978		\$ 4,394,539
<b>A. Transmission Line Knickerbocker to Churchtown</b>					\$ 12,362,395		\$ 47,425,421		\$ 59,787,815
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 597,878	\$ 597,878	\$ 597,878	\$ 597,878
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,728,637	\$ 3,728,637	\$ 3,728,637	\$ 3,728,637
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 597,878	\$ 597,878	\$ 597,878	\$ 597,878
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 597,878	\$ 597,878	\$ 597,878	\$ 597,878
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,989,391	\$ 2,989,391	\$ 2,989,391	\$ 2,989,391
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 179,363	\$ 179,363	\$ 179,363	\$ 179,363
6.7	Geotech	22	Location	\$ -	\$ -	\$ 3,500	\$ 77,000	\$ 3,500	\$ 77,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 418,515	\$ 418,515	\$ 418,515	\$ 418,515
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 179,363	\$ 179,363	\$ 179,363	\$ 179,363
6.13	Real Estate Costs (New ROW)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 3,186,000	\$ 3,186,000	\$ 3,186,000	\$ 3,186,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 988,992	\$ 988,992	\$ -	\$ -	\$ 988,992	\$ 988,992
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 59,788	\$ 59,788	\$ 59,788	\$ 59,788
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 988,992		\$ 12,651,692		\$ 13,640,683

**NextEra T023 (Segment B Alternate)**

**B. Transmission Line Churchtown to Pleasant Valley**

Estimate Revision: **8** Total: \$ **122,633,835**

NextEra T023 (Segment B Alternate)			
	Supply	Installation	Total
<b>B. Transmission Line Churchtown to Pleasant Valley</b>			
1. CLEARING & ACCESS	\$ 14,000	\$ 19,576,466	\$ 19,590,466
2. FOUNDATIONS	\$ 1,639,170	\$ 12,502,886	\$ 14,142,057
3. STRUCTURES	\$ 6,814,286	\$ 34,951,509	\$ 41,765,796
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,421,997	\$ 15,009,440	\$ 18,431,437
5. INSULATORS, FITTINGS, HARDWARE	\$ 4,481,834	\$ 2,308,928	\$ 6,790,763
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,309,703	\$ 20,603,613	\$ 21,913,317
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 17,680,991</b>	<b>\$ 104,952,843</b>	<b>\$ 122,633,835</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 17,680,991</b>	<b>\$ 104,952,843</b>	<b>\$ 122,633,835</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Churchtown to Pleasant Valley</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	98.0	Acre	\$ -	\$ -	\$ 5,000	\$ 490,000	\$ 5,000	\$ 490,000
1.3	Permanent Access Road	34,108.8	LF	\$ -	\$ -	\$ 45	\$ 1,534,896	\$ 45	\$ 1,534,896
1.4	Silt Fence	170,544.0	LF	\$ -	\$ -	\$ 4	\$ 682,176	\$ 4	\$ 682,176
1.5	Matting - Access and ROW	136,435.2	LF	\$ -	\$ -	\$ 70	\$ 9,550,464	\$ 70	\$ 9,550,464
1.6	Matting - To Work Area	18,750.0	LF	\$ -	\$ -	\$ 70	\$ 1,312,500	\$ 70	\$ 1,312,500
1.7	Snow Removal	32.3	Mile	\$ -	\$ -	\$ 16,000	\$ 516,800	\$ 16,000	\$ 516,800
1.8	ROW Restoration	32.3	Mile	\$ -	\$ -	\$ 10,000	\$ 323,000	\$ 10,000	\$ 323,000
1.9	Work Pads	1,250,000.0	SF	\$ -	\$ -	\$ 4	\$ 4,400,000	\$ 4	\$ 4,400,000
1.10	Restoration for Work Pad areas	250,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 37,500	\$ 0	\$ 37,500
1.11	Temporary Access Bridge	14	EA	\$ -	\$ -	\$ 20,035	\$ 280,490	\$ 20,035	\$ 280,490
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	12	EA	\$ -	\$ -	\$ 4,580	\$ 54,960	\$ 4,580	\$ 54,960
1.14	Maintenance and Protection of Traffic on Public Roads	86	EA	\$ -	\$ -	\$ 4,130	\$ 355,180	\$ 4,130	\$ 355,180
1.15	Gates	4	EA	\$ 2,000	\$ 8,000	\$ 2,500	\$ 10,000	\$ 4,500	\$ 18,000
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 14,000		\$ 19,576,466		\$ 19,590,466
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV S/C DEADEND, STEEL	6	EA	\$ 50,485	\$ 302,911	\$ 51,026	\$ 306,156	\$ 101,511	\$ 609,067
2.2	Drilled Pier - 345KV S/C DEADEND, STEEL	15	EA	\$ 64,923	\$ 973,838	\$ 65,618	\$ 984,267	\$ 130,540	\$ 1,958,105
2.3	Direct Embed - 115/345KV D/C TANGENT, CONCRETE	229	EA	\$ 1,583	\$ 362,421	\$ 10,762	\$ 2,464,464	\$ 12,344	\$ 2,826,885
2.4									
2.5	Rock Excavation Adder	4,374.0	CY	\$ -	\$ -	\$ 2,000	\$ 8,748,000	\$ 2,000	\$ 8,748,000
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,639,170		\$ 12,502,886		\$ 14,142,057

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3. STRUCTURES</b>									
3.1	345KV S/C DEADEND, STEEL	6	Structure	\$ 90,765	\$ 544,588	\$ 54,459	\$ 326,753	\$ 145,224	\$ 871,341
3.2	345KV S/C DEADEND, STEEL	15	Structure	\$ 120,698	\$ 1,810,466	\$ 72,419	\$ 1,086,279	\$ 193,116	\$ 2,896,745
3.3	115/345KV D/C TANGENT, CONCRETE	229	Structure	\$ 18,920	\$ 4,332,733	\$ 82,395	\$ 18,868,352	\$ 101,315	\$ 23,201,085
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12	Remove Existing Foundation	2,084	EA	\$ -	\$ -	\$ 3,250	\$ 6,773,000	\$ 3,250	\$ 6,773,000
3.13	Remove Existing Structure and Accessories	521	EA	\$ -	\$ -	\$ 12,500	\$ 6,512,500	\$ 12,500	\$ 6,512,500
3.14	Install Grounding and Grounding Accessories	250	Structure	\$ 506	\$ 126,500	\$ 5,539	\$ 1,384,625	\$ 6,045	\$ 1,511,125
3.15									
3.16									
3.17									
<b>TOTAL - STRUCTURES PRINCTOWN TO NEW SCOTLAND:</b>					\$ 6,814,286		\$ 34,951,509		\$ 41,765,796
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 1,033kcmil 54/7 ACSS "Curlew"	1,094,386	LF	\$ 1.90	\$ 2,079,333	\$ 5.00	\$ 5,471,930	\$ 6.90	\$ 7,551,263
4.2	(1) OPGW 36 Fiber AC-33/38/571	182,398	LF	\$ 1.35	\$ 246,237	\$ 5.00	\$ 911,990	\$ 6.35	\$ 1,158,227
4.3	(1) 3/8" EHS7 Steel	182,398	LF	\$ 0.47	\$ 85,727	\$ 5.00	\$ 911,990	\$ 5.47	\$ 997,717
4.5	Remove Existing 115kV Cable From Existing Structures	130.4	Mile	\$ -	\$ -	\$ 30,000	\$ 3,912,000	\$ 30,000.00	\$ 3,912,000
4.6	Remove Existing OPGW Cable and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.7	Remove Existing OHSW and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.8	115kV - (1) 795kcmil 26/7 ACSS "Drake"	543,866	LF	\$ 1.72	\$ 935,450	\$ 5.00	\$ 2,719,330	\$ 6.72	\$ 3,654,780
4.9									
4.10	Rider Poles - Relocated	43	Set	\$ -	\$ -	\$ 3,500	\$ 150,500	\$ 3,500.00	\$ 150,500
4.11	Rider Poles (86 Total)	43	EA	\$ 1,750	\$ 75,250	\$ 3,500	\$ 150,500	\$ 5,250.00	\$ 225,750
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,421,997		\$ 15,009,440		\$ 18,431,437
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,145	Assembly	\$ 1,800	\$ 2,061,000	\$ 720	\$ 824,400	\$ 2,520	\$ 2,885,400
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	1,374	Assembly	\$ 900	\$ 1,236,600	\$ 560	\$ 769,440	\$ 1,460	\$ 2,006,040
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	315	Assembly	\$ 1,800	\$ 567,000	\$ 720	\$ 226,800	\$ 2,520	\$ 793,800
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	105	Assembly	\$ 900	\$ 94,500	\$ 560	\$ 58,800	\$ 1,460	\$ 153,300
5.5	OPGW Assembly - Tangent	229	Assembly	\$ 200	\$ 45,800	\$ 150	\$ 34,350	\$ 350	\$ 80,150
5.6	OPGW Assembly - Angle / DE	42	Assembly	\$ 250	\$ 10,500	\$ 150	\$ 6,300	\$ 400	\$ 16,800
5.7	OHSW Assembly - Tangent	229	Assembly	\$ 200	\$ 45,800	\$ 150	\$ 34,350	\$ 350	\$ 80,150
5.8	OHSW Assembly - Angle / DE	42	Assembly	\$ 250	\$ 10,500	\$ 150	\$ 6,300	\$ 400	\$ 16,800
5.9	OPGW Splice Boxes	12	Set	\$ 1,746	\$ 20,954	\$ 2,274	\$ 27,288	\$ 4,020	\$ 48,242
5.10	OPGW Splice & Test	12	EA	\$ 2,520	\$ 30,240	\$ 2,520	\$ 30,240	\$ 5,040	\$ 60,480
5.11	Spacer - Conductor	5,414	EA	\$ 50	\$ 270,700	\$ 35	\$ 189,490	\$ 85	\$ 460,190
5.12	Vibration Dampers - Conductor	1,299	EA	\$ 35	\$ 45,465	\$ 35	\$ 45,465	\$ 70	\$ 90,930
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	656	EA	\$ 27	\$ 17,712	\$ 35	\$ 22,960	\$ 62	\$ 40,672
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	32.6	Mile	\$ 770	\$ 25,064	\$ 1,006	\$ 32,745	\$ 1,776	\$ 57,809
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 4,481,834		\$ 2,308,928		\$ 6,790,763
<b>B. Transmission Line Churchtown to Pleasant Valley</b>					\$ 16,371,288		\$ 84,349,230		\$ 100,720,518
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,007,205	\$ 1,007,205	\$ 1,007,205	\$ 1,007,205
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 6,281,385	\$ 6,281,385	\$ 6,281,385	\$ 6,281,385

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,007,205	\$ 1,007,205	\$ 1,007,205	\$ 1,007,205
6.4	Site Accommodation, Facilities, Storage <b>Engineering</b>	1	LS	\$ -	\$ -	\$ 1,007,205	\$ 1,007,205	\$ 1,007,205	\$ 1,007,205
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 5,036,026	\$ 5,036,026	\$ 5,036,026	\$ 5,036,026
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 302,162	\$ 302,162	\$ 302,162	\$ 302,162
6.7	Geotech	33	Location	\$ -	\$ -	\$ 3,500	\$ 115,500	\$ 3,500	\$ 115,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 705,044	\$ 705,044	\$ 705,044	\$ 705,044
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 302,162	\$ 302,162	\$ 302,162	\$ 302,162
6.13	Real Estate Costs (New ROW)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 4,699,000	\$ 4,699,000	\$ 4,699,000	\$ 4,699,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,309,703	\$ 1,309,703	\$ -	\$ -	\$ 1,309,703	\$ 1,309,703
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 100,721	\$ 100,721	\$ 100,721	\$ 100,721
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,309,703		\$ 20,603,613		\$ 21,913,317

**NextEra T023 (Segment B Alternate)**

**C. Blue Stores Junction to Blue Stores Substation**

Estimate Revision: **8**

Total: \$ **5,750,574**

NextEra T023 (Segment B Alternate)			
	Supply	Installation	Total
<b>C. Blue Stores Junction to Blue Stores Substation</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,404,512	\$ 1,404,512
2. FOUNDATIONS	\$ 236,848	\$ 925,954	\$ 1,162,802
3. STRUCTURES	\$ 596,484	\$ 946,665	\$ 1,543,149
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 84,763	\$ 387,095	\$ 471,858
5. INSULATORS, FITTINGS, HARDWARE	\$ 107,544	\$ 56,496	\$ 164,040
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 82,051	\$ 922,162	\$ 1,004,213
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>1,107,690</b>	\$ <b>4,642,884</b>	\$ <b>5,750,574</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>1,107,690</b>	\$ <b>4,642,884</b>	\$ <b>5,750,574</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	4.0	Acre	\$ -	\$ -	\$ 5,000	\$ 20,000	\$ 5,000	\$ 20,000
1.3	Permanent Access Road	2,218	LF	\$ -	\$ -	\$ 45	\$ 99,792	\$ 45	\$ 99,792
1.4	Silt Fence	11,088.0	LF	\$ -	\$ -	\$ 4	\$ 44,352	\$ 4	\$ 44,352
1.5	Matting - Access and ROW	8,870	LF	\$ -	\$ -	\$ 70	\$ 620,928	\$ 70	\$ 620,928
1.6	Matting - To Work Area	1,800.0	LF	\$ -	\$ -	\$ 70	\$ 126,000	\$ 70	\$ 126,000
1.7	Snow Removal	2.1	Mile	\$ -	\$ -	\$ 16,000	\$ 33,600	\$ 16,000	\$ 33,600
1.8	ROW Restoration	2.1	Mile	\$ -	\$ -	\$ 10,000	\$ 21,000	\$ 10,000	\$ 21,000
1.9	Work Pads	120,000.0	SF	\$ -	\$ -	\$ 4	\$ 422,400	\$ 4	\$ 422,400
1.10	Restoration for Work Pad areas	24,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 3,600	\$ 0	\$ 3,600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	1	EA	\$ -	\$ -	\$ 4,580	\$ 4,580	\$ 4,580	\$ 4,580
1.14	Maintenance and Protection of Traffic on Public Roads	2	EA	\$ -	\$ -	\$ 4,130	\$ 8,260	\$ 4,130	\$ 8,260
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	-	EA	\$ -	\$ -	\$ 1,850	\$ -	\$ 1,850	\$ -
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ -	\$ -	\$ 1,404,512	\$ -	\$ 1,404,512
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	6	EA	\$ 31,225	\$ 187,348	\$ 31,559	\$ 189,354	\$ 62,784	\$ 376,702
2.2	Direct Embed - 115kV Single Circuit H- Pole Tangent	18	EA	\$ 2,750	\$ 49,500	\$ 18,700	\$ 336,600	\$ 21,450	\$ 386,100
2.3	Rock Excavation Adder	200.0	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 236,848		\$ 925,954		\$ 1,162,802
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit H- Pole Angle/ DE	6	Structure	\$ 39,822	\$ 238,929	\$ 23,893	\$ 143,358	\$ 63,714	\$ 382,287
3.2	115kV Single Circuit H- Pole Tangent	18	Structure	\$ 18,515	\$ 333,266	\$ 11,109	\$ 199,960	\$ 29,624	\$ 533,226
3.3	Remove Existing Foundation	-	EA	\$ -	\$ -	\$ 7,500	\$ -	\$ 7,500	\$ -
3.4	Remove Existing Structure and Accessories	27	EA	\$ -	\$ -	\$ 12,500	\$ 337,500	\$ 12,500	\$ 337,500
3.5									
3.6	Install Grounding and Grounding Accessories	48	Structure	\$ 506	\$ 24,288	\$ 5,539	\$ 265,848	\$ 6,045	\$ 290,136
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 596,484		\$ 946,665		\$ 1,543,149
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSR "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.4	115kV - (1) 795kcmil 26/7 ACSR "Drake"	34,927.0	LF	\$ 1.72	\$ 60,074	\$ 5.00	\$ 174,635	\$ 6.72	\$ 234,709
4.5	(1) OPGW 36 Fiber AC-33/38/571	11,642.0	LF	\$ 1.35	\$ 15,717	\$ 5.00	\$ 58,210	\$ 6.35	\$ 73,927
4.6	(1) 3/8" EHS7 Steel	11,642.0	LF	\$ 0.47	\$ 5,472	\$ 5.00	\$ 58,210	\$ 5.47	\$ 63,682
4.7	Remove Existing Cable	2.1	Mile	\$ -	\$ -	\$ 30,000	\$ 63,600	\$ 30,000.00	\$ 63,600
4.8	Remove Existing OPGW Cable and Accessories	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.9	Remove Existing OHSW and Accessories	2.1	Mile	\$ -	\$ -	\$ 12,000	\$ 25,440	\$ 12,000.00	\$ 25,440
4.10		-							
4.11		-							
4.12	Rider Poles (Locations)	2.0	EA	\$ 1,750	\$ 3,500	\$ 3,500	\$ 7,000	\$ 5,250.00	\$ 10,500
4.13									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 84,763		\$ 387,095		\$ 471,858
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	54	Assembly	\$ 900	\$ 48,600	\$ 360	\$ 19,440	\$ 1,260	\$ 68,040
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	36	Assembly	\$ 900	\$ 32,400	\$ 360	\$ 12,960	\$ 1,260	\$ 45,360
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.7	OPGW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.8	OHSW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.9	OHSW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.10	OPGW Splice Boxes	2	Set	\$ 1,746	\$ 3,492	\$ 2,274	\$ 4,548	\$ 4,020	\$ 8,040
5.11	OPGW Splice & Test	2	EA	\$ 2,520	\$ 5,040	\$ 2,520	\$ 5,040	\$ 5,040	\$ 10,080
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	72	EA	\$ 35	\$ 2,520	\$ 35	\$ 2,520	\$ 70	\$ 5,040
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	25	EA	\$ 27	\$ 675	\$ 35	\$ 875	\$ 62	\$ 1,550
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	2.1	Mile	\$ 770	\$ 1,617	\$ 1,006	\$ 2,113	\$ 1,776	\$ 3,730
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 107,544		\$ 56,496		\$ 164,040

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>					\$ 1,025,639		\$ 3,720,722		\$ 4,746,361
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 296,004	\$ 296,004	\$ 296,004	\$ 296,004
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 237,318	\$ 237,318	\$ 237,318	\$ 237,318
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.7	Geotech	2	Location	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 33,225	\$ 33,225	\$ 33,225	\$ 33,225
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.13	Real Estate Costs (New ROW)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 153,000	\$ 153,000	\$ 153,000	\$ 153,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 82,051	\$ 82,051	\$ -	\$ -	\$ 82,051	\$ 82,051
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 4,746	\$ 4,746	\$ 4,746	\$ 4,746
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 82,051		\$ 922,162		\$ 1,004,213

**NextEra T023 (Segment B Alternate)**

**D. Knickerbocker 345kV Substation - Install**

Estimate Revision: **8** Total: \$ **19,121,061**

NextEra T023 (Segment B Alternate)			
	Supply	Installation	Total
<b>D. Knickerbocker 345kV Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 223,675	\$ 1,936,115	\$ 2,159,790
2. SUBSTATION FOUNDATIONS	\$ 1,572,935	\$ 1,694,150	\$ 3,267,085
3. SUBSTATION STRUCTURES	\$ 727,975	\$ 727,975	\$ 1,455,950
4. MAJOR EQUIPMENT	\$ 600,000	\$ 240,000	\$ 840,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,086,500	\$ 489,500	\$ 1,576,000
6. CONTROL HOUSE / PANELS	\$ 1,837,125	\$ 1,227,625	\$ 3,064,750
7. MISC ITEMS	\$ 1,061,528	\$ 1,684,810	\$ 2,746,338
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 568,779	\$ 3,442,369	\$ 4,011,148
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 7,678,517</b>	<b>\$ 11,442,544</b>	<b>\$ 19,121,061</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 7,678,517</b>	<b>\$ 11,442,544</b>	<b>\$ 19,121,061</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Knickerbocker 345kV Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	3.875	ACRES	\$ -	\$ -	\$ 355,000	\$ 1,375,625	\$ 355,000	\$ 1,375,625
1.2	Station stone within substation fence.	1,650	CY	\$ 27	\$ 44,550	\$ 75	\$ 123,750	\$ 102	\$ 168,300
1.3	Substation Fence	1,660	LF	\$ 100	\$ 166,000	\$ 100	\$ 166,000	\$ 200	\$ 332,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide	275	LF	\$ 35	\$ 9,625	\$ 285	\$ 78,375	\$ 320	\$ 88,000
1.7	Pavement	3,373	SY	\$ -	\$ -	\$ 55	\$ 185,515	\$ 55	\$ 185,515
1.8	Gates	1	EA	\$ 2,000	\$ 2,000	\$ 2,500	\$ 2,500	\$ 4,500	\$ 4,500
1.9	Culverts / Misc. Access	2	EA	\$ 750	\$ 1,500	\$ 1,250	\$ 2,500	\$ 2,000	\$ 4,000
1.10	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 223,675		\$ 1,936,115		\$ 2,159,790
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	16	EA	\$ 26,145	\$ 418,320	\$ 28,000	\$ 448,000	\$ 54,145	\$ 866,320
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	72	EA	\$ 4,482	\$ 322,704	\$ 4,800	\$ 345,600	\$ 9,282	\$ 668,304
2.1f	Station Service Transformer Stand Foundation	4	EA	\$ 4,482	\$ 17,928	\$ 4,800	\$ 19,200	\$ 9,282	\$ 37,128
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	72	EA	\$ 4,482	\$ 322,704	\$ 4,800	\$ 345,600	\$ 9,282	\$ 668,304
2.1j	Instrument Transformer Stand Foundations	27	EA	\$ 4,482	\$ 121,014	\$ 4,800	\$ 129,600	\$ 9,282	\$ 250,614
2.1k	Arrester Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1m	Wave Trap Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -
2.1p									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1q									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 44,260	\$ 44,260	\$ 47,400	\$ 47,400	\$ 91,660	\$ 91,660
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 9,750	\$ 9,750	\$ 9,750	\$ 9,750
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	5	EA	\$ 5,229	\$ 26,145	\$ 5,600	\$ 28,000	\$ 10,829	\$ 54,145
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,572,935		\$ 1,694,150		\$ 3,267,085
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	4	EA	\$ 37,000	\$ 148,000	\$ 37,000	\$ 148,000	\$ 74,000	\$ 296,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	12	EA	\$ 14,800	\$ 177,600	\$ 14,800	\$ 177,600	\$ 29,600	\$ 355,200
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	72	EA	\$ 3,700	\$ 266,400	\$ 3,700	\$ 266,400	\$ 7,400	\$ 532,800
3.1g	Instrument Transformer Stand	27	EA	\$ 1,850	\$ 49,950	\$ 1,850	\$ 49,950	\$ 3,700	\$ 99,900
3.1h	Arrester Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1j	Wave Trap Stand	3	EA	\$ 7,400	\$ 22,200	\$ 7,400	\$ 22,200	\$ 14,800	\$ 44,400
3.1k	Lightning Mast - 70'	5	EA	\$ 6,475	\$ 32,375	\$ 6,475	\$ 32,375	\$ 12,950	\$ 64,750
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 727,975	\$ 727,975		\$ 1,455,950	
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks with Reactors	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c									
4.1d									
4.1e									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 600,000	\$ 240,000		\$ 840,000	

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	3	EA	\$ 40,000	\$ 120,000	\$ 15,000	\$ 45,000	\$ 55,000	\$ 165,000
5.1b	Disconnect Switches - 3ph w/ manual operator	6	EA	\$ 35,000	\$ 210,000	\$ 17,500	\$ 105,000	\$ 52,500	\$ 315,000
5.1c	VT'S	9	EA	\$ 25,000	\$ 225,000	\$ 12,000	\$ 108,000	\$ 37,000	\$ 333,000
5.1d	CT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1e	CCVT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ 10,000	\$ -	\$ 8,000	\$ -	\$ 18,000	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ 1,500	\$ -	\$ 1,500	\$ -	\$ 3,000	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,086,500		\$ 489,500		\$ 1,576,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 409,500	\$ 409,500	\$ 95,000	\$ 95,000	\$ 504,500	\$ 504,500
6.2	Protection and Telecom Equipment Panels	17	EA	\$ 35,000	\$ 595,000	\$ 10,000	\$ 170,000	\$ 45,000	\$ 765,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 317,625	\$ 317,625	\$ 317,625	\$ 317,625	\$ 635,250	\$ 635,250
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,837,125		\$ 1,227,625		\$ 3,064,750

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,050	LF	\$ 185.00	\$ 194,250	\$ 170.00	\$ 178,500	\$ 355	\$ 372,750
7.2	Rigid Bus, Fittings & Insulators	1,900	LF	\$ 125.07	\$ 237,633	\$ 237.10	\$ 450,490	\$ 362	\$ 688,123
7.3	Strain Bus, Connectors & Insulators	1,000	LF	\$ 39.30	\$ 39,300	\$ 53.35	\$ 53,350	\$ 93	\$ 92,650
7.4	Grounding System	16,500	LF	\$ 6.93	\$ 114,345	\$ 32.58	\$ 537,570	\$ 40	\$ 651,915
7.5	Strain Bus Insulators - 345kV	38	EA	\$ 2,000	\$ 76,000	\$ 1,050	\$ 39,900	\$ 3,050	\$ 115,900
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,061,528		\$ 1,684,810		\$ 2,746,338
<b>D. Knickerbocker 345kV Substation - Install</b>					\$ 7,109,738		\$ 8,000,175		\$ 15,109,913
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 151,099	\$ 151,099	\$ 151,099	\$ 151,099
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 942,322	\$ 942,322	\$ 942,322	\$ 942,322
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 151,099	\$ 151,099	\$ 151,099	\$ 151,099
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 151,099	\$ 151,099	\$ 151,099	\$ 151,099
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,208,793	\$ 1,208,793	\$ 1,208,793	\$ 1,208,793
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 105,769	\$ 105,769	\$ 105,769	\$ 105,769
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 377,748	\$ 377,748	\$ 377,748	\$ 377,748
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 45,330	\$ 45,330	\$ 45,330	\$ 45,330
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 280,000	\$ 280,000	\$ 280,000	\$ 280,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 568,779	\$ 568,779	\$ -	\$ -	\$ 568,779	\$ 568,779
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 15,110	\$ 15,110	\$ 15,110	\$ 15,110
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 568,779		\$ 3,442,369		\$ 4,011,148

**NextEra T023 (Segment B Alternate)**

**H. North Churchtown Substation - Install**

Estimate Revision: **8**

Total: \$ 16,285,817

NextEra T023 (Segment B Alternate)			
	Supply	Installation	Total
<b>H. North Churchtown Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 919,243	\$ 2,855,295	\$ 3,774,539
2. SUBSTATION FOUNDATIONS	\$ 773,458	\$ 834,700	\$ 1,608,158
3. SUBSTATION STRUCTURES	\$ 208,000	\$ 338,365	\$ 676,730
4. MAJOR EQUIPMENT	\$ 208,000	\$ 240,000	\$ 448,000
5. SMALL EQUIPMENT / MATERIALS	\$ 954,540	\$ 637,800	\$ 1,592,340
6. CONTROL HOUSE / PANELS	\$ 1,962,850	\$ 1,310,350	\$ 3,273,200
7. MISC ITEMS	\$ 731,113	\$ 935,704	\$ 1,666,817
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 471,006	\$ 2,775,028	\$ 3,246,034
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 6,228,210	\$ 9,927,242	\$ 16,285,817
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 6,228,210	\$ 9,927,242	\$ 16,285,817

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. North Churchtown Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	2.125	ACRES	\$ -	\$ -	\$ 660,000	\$ 1,402,500	\$ 660,000	\$ 1,402,500
1.2	Station stone within substation fence.	600	CY	\$ 27	\$ 16,200	\$ 75	\$ 45,000	\$ 102	\$ 61,200
1.3	Substation Fence	970	LF	\$ 100	\$ 97,000	\$ 100	\$ 97,000	\$ 200	\$ 194,000
1.4	Permanent Access Road - 20'-Wide	650	LF	\$ 35	\$ 22,750	\$ 285	\$ 185,250	\$ 320	\$ 208,000
1.5	Retaining Wall (1050' x Avg. of 7.15')	1	LS	\$ 318,371	\$ 318,371	\$ 492,245	\$ 492,245	\$ 810,616	\$ 810,616
1.6	Compacted Fill (Sand)	27,143	CY	\$ 17	\$ 461,423	\$ 20	\$ 542,850	\$ 37	\$ 1,004,273
1.7									
1.8	Pavement	1,520	SY	\$ -	\$ -	\$ 55	\$ 83,600	\$ 55	\$ 83,600
1.9	Gates	1	EA	\$ 2,000	\$ 2,000	\$ 2,500	\$ 2,500	\$ 4,500	\$ 4,500
1.10	Culverts / Misc. Access	2	EA	\$ 750	\$ 1,500	\$ 1,250	\$ 2,500	\$ 2,000	\$ 4,000
1.11	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 919,243		\$ 2,855,295		\$ 3,774,539
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -
2.1p									
					\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	4	EA	\$ 5,229	\$ 20,916	\$ 5,600	\$ 22,400	\$ 10,829	\$ 43,316
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	24	EA	\$ 16,434	\$ 394,416	\$ 17,600	\$ 422,400	\$ 34,034	\$ 816,816
2.3e	Switch Stand Foundations	24	EA	\$ 2,988	\$ 71,712	\$ 3,200	\$ 76,800	\$ 6,188	\$ 148,512
2.3f	Fuse Stand Foundations	2	EA	\$ 2,988	\$ 5,976	\$ 3,200	\$ 6,400	\$ 6,188	\$ 12,376
2.3g	Bus Support 3ph Foundations	8	EA	\$ 2,988	\$ 23,904	\$ 3,200	\$ 25,600	\$ 6,188	\$ 49,504
2.3h	Bus Support 1 Ph Foundations	12	EA	\$ 2,988	\$ 35,856	\$ 3,200	\$ 38,400	\$ 6,188	\$ 74,256
2.3j	Instrument Transformer Stand Foundations	36	EA	\$ 2,988	\$ 107,568	\$ 3,200	\$ 115,200	\$ 6,188	\$ 222,768
2.3k	Arrester Stand Foundations	12	EA	\$ 2,988	\$ 35,856	\$ 3,200	\$ 38,400	\$ 6,188	\$ 74,256
2.3m	Wave Trap Stand Foundations	8	EA	\$ 2,988	\$ 23,904	\$ 3,200	\$ 25,600	\$ 6,188	\$ 49,504
2.3n	Station Service Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 33,615	\$ 33,615	\$ 36,000	\$ 36,000	\$ 69,615	\$ 69,615
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 1ph.	1	LS	\$ -	\$ -	\$ 6,500	\$ 6,500	\$ 6,500	\$ 6,500
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 773,458		\$ 834,700		\$ 1,608,158
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	8	EA	\$ 18,500	\$ 148,000	\$ 18,500	\$ 148,000	\$ 37,000	\$ 296,000
3.3c	Switch Stands	12	EA	\$ 7,955	\$ 95,460	\$ 7,955	\$ 95,460	\$ 15,910	\$ 190,920
3.3d	Fuse Stand	1	EA	\$ 7,955	\$ 7,955	\$ 7,955	\$ 7,955	\$ 15,910	\$ 15,910
3.3e	Bus Support 3ph	4	EA	\$ 3,330	\$ 13,320	\$ 3,330	\$ 13,320	\$ 6,660	\$ 26,640
3.3f	Bus Support 1 Ph	12	EA	\$ 1,850	\$ 22,200	\$ 1,850	\$ 22,200	\$ 3,700	\$ 44,400
3.3g	Instrument Transformer Stand	36	EA	\$ 740	\$ 26,640	\$ 740	\$ 26,640	\$ 1,480	\$ 53,280
3.3h	Arrester Stand	12	EA	\$ 740	\$ 8,880	\$ 740	\$ 8,880	\$ 1,480	\$ 17,760
3.3j	Wave Trap Stand	4	EA	\$ 3,700	\$ 14,800	\$ 3,700	\$ 14,800	\$ 7,400	\$ 29,600
3.3k	Lightning Mast	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
3.3l	Station Service Transformer Support Stand	1	EA	\$ 1,110	\$ 1,110	\$ 1,110	\$ 1,110	\$ 2,220	\$ 2,220
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 338,365		\$ 338,365		\$ 676,730
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 300,000	\$ -	\$ 80,000	\$ -	\$ 380,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	4	EA	\$ 52,000	\$ 208,000	\$ 60,000	\$ 240,000	\$ 112,000	\$ 448,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 208,000		\$ 240,000		\$ 448,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	4	EA	\$ 33,000	\$ 132,000	\$ 15,000	\$ 60,000	\$ 48,000	\$ 192,000
5.3b	Disconnect Switches - 3ph w/ manual operator	8	EA	\$ 28,000	\$ 224,000	\$ 17,500	\$ 140,000	\$ 45,500	\$ 364,000
5.3c	VT'S	12	EA	\$ 13,000	\$ 156,000	\$ 8,000	\$ 96,000	\$ 21,000	\$ 252,000
5.3d	CT'S	12	EA	\$ 13,000	\$ 156,000	\$ 8,000	\$ 96,000	\$ 21,000	\$ 252,000
5.3e	CCVT'S	12	EA	\$ 8,000	\$ 96,000	\$ 8,000	\$ 96,000	\$ 16,000	\$ 192,000
5.3f	Arresters	12	EA	\$ 3,420	\$ 41,040	\$ 6,000	\$ 72,000	\$ 9,420	\$ 113,040
5.3g	Wave Traps	4	EA	\$ 13,000	\$ 52,000	\$ 8,000	\$ 32,000	\$ 21,000	\$ 84,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3h	Station Service Transformers	1	EA	\$ 75,000	\$ 75,000	\$ 35,000	\$ 35,000	\$ 110,000	\$ 110,000
5.3j	Fuses	3	EA	\$ 7,500	\$ 22,500	\$ 3,600	\$ 10,800	\$ 11,100	\$ 33,300
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 954,540		\$ 637,800		\$ 1,592,340
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 292,500	\$ 292,500	\$ 85,000	\$ 85,000	\$ 377,500	\$ 377,500
6.2	Protection and Telecom Equipment Panels	23	EA	\$ 35,000	\$ 805,000	\$ 10,000	\$ 230,000	\$ 45,000	\$ 1,035,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 350,350	\$ 350,350	\$ 350,350	\$ 350,350	\$ 700,700	\$ 700,700
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,962,850		\$ 1,310,350		\$ 3,273,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	600.0	LF	\$ 185.00	\$ 111,000	\$ 170.00	\$ 102,000	\$ 355	\$ 213,000
7.2	Rigid Bus, Fittings & Insulators	700.0	LF	\$ 125.07	\$ 87,549	\$ 237.10	\$ 165,970	\$ 362	\$ 253,519
7.3	Strain Bus, Connectors & Insulators	1,000.0	LF	\$ 39.30	\$ 39,300	\$ 53.35	\$ 53,350	\$ 93	\$ 92,650
7.4	Grounding System	4,800.0	LF	\$ 6.93	\$ 33,264	\$ 32.58	\$ 156,384	\$ 40	\$ 189,648
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	60	EA	\$ 1,000	\$ 60,000	\$ 550	\$ 33,000	\$ 1,550	\$ 93,000
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 731,113		\$ 935,704		\$ 1,666,817
<b>H. North Churchtown Substation - Install</b>									
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 5,887,569		\$ 7,152,214		\$ 13,039,784
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 130,398	\$ 130,398	\$ 130,398	\$ 130,398
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 813,220	\$ 813,220	\$ 813,220	\$ 813,220
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 130,398	\$ 130,398	\$ 130,398	\$ 130,398
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 130,398	\$ 130,398	\$ 130,398	\$ 130,398
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,043,183	\$ 1,043,183	\$ 1,043,183	\$ 1,043,183
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 91,278	\$ 91,278	\$ 91,278	\$ 91,278
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 325,995	\$ 325,995	\$ 325,995	\$ 325,995
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 39,119	\$ 39,119	\$ 39,119	\$ 39,119
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 44,000	\$ 44,000	\$ 44,000	\$ 44,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 471,006	\$ 471,006	\$ -	\$ -	\$ 471,006	\$ 471,006
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 13,040	\$ 13,040	\$ 13,040	\$ 13,040
	<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>				\$ 471,006		\$ 2,775,028		\$ 3,246,034

**NextEra T023 (Segment B Alternate)**

**I. Greenbush Substation - Removal**

Estimate Revision: **8**

Total: \$ **70,639**

NextEra T023 (Segment B Alternate)			
	Supply	Installation	Total
<b>I. Greenbush Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 12,000	\$ 12,000
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ 7,000	\$ 7,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 35,000	\$ 35,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 7,200	\$ 7,200
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 9,439	\$ 9,439
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 70,639	\$ 70,639
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 70,639	\$ 70,639

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. Greenbush Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 7,200	\$ 7,200	\$ 7,200	\$ 7,200
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	2	EA	\$ -	\$ -	\$ 2,400	\$ 4,800	\$ 2,400	\$ 4,800
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 12,000		\$ 12,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	1	EA	\$ -	\$ -	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 7,000		\$ 7,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	2	EA	\$ -	\$ -	\$ 17,500	\$ 35,000	\$ 17,500	\$ 35,000
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 35,000		\$ 35,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	2	EA	\$ -	\$ -	\$ 3,600	\$ 7,200	\$ 3,600	\$ 7,200
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 7,200		\$ 7,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	EA	\$ -	\$ -	\$ 126.25	\$ -	\$ 126	\$ -
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>I. Greenbush Substation - Removal</b>					\$ -		\$ 61,200		\$ 61,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, Admin, Materials Management Staff)	1	Months			\$ 3,319	\$ 3,319	\$ 3,319	\$ 3,319
8.3	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Engineering</b>									
8.4	Design Engineering	1.0	LS	\$ -	\$ -	\$ 4,896	\$ 4,896	\$ 4,896	\$ 4,896
8.5	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.6	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Surveying/Staking	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Testing &amp; Commissioning</b>									
8.8	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Permitting and Additional Costs</b>									
8.9	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.10	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Warranties / LOC's	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.13	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Sales Tax on Materials	1.0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 9,439		\$ 9,439

**NextEra T023 (Segment B Alternate)**

**J. Pleasant Valley Substation - Install**

Estimate Revision: **8**

Total: \$ **3,526,782**

<i>NextEra T023 (Segment B Alternate)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>J. Pleasant Valley Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 11,025	\$ 14,625	\$ 25,650
2. SUBSTATION FOUNDATIONS	\$ 161,177	\$ 171,300	\$ 332,477
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 260,500	\$ 129,000	\$ 389,500
6. CONTROL HOUSE / PANELS	\$ 560,900	\$ 253,400	\$ 814,300
7. MISC ITEMS	\$ 409,950	\$ 457,275	\$ 867,225
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 131,836	\$ 596,994	\$ 728,830
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,779,788	\$ 1,746,994	\$ 3,526,782
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,779,788	\$ 1,746,994	\$ 3,526,782

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Pleasant Valley Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 230,000	\$ -	\$ 230,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	90	LF	\$ 100	\$ 9,000	\$ 100	\$ 9,000	\$ 200	\$ 18,000
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 11,025		\$ 14,625		\$ 25,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House Addition Foundation (25-ft x 50-ft)	1	EA	\$ 61,079	\$ 61,079	\$ 64,100	\$ 64,100	\$ 125,179	\$ 125,179
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 161,177		\$ 171,300		\$ 332,477
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>						\$ 44,400	\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks - W/ Center Tap VT and Reactors	0	EA	\$ 370,000	\$ -	\$ 80,000	\$ -	\$ 450,000	\$ -
4.1c	Circuit Breakers - Cap Switching	0	EA	\$ 220,000	\$ -	\$ 750,000	\$ -	\$ 970,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 225,000	\$ -	\$ 60,000	\$ -	\$ 285,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>						\$ 200,000	\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 111,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 8,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 260,500		\$ 129,000		\$ 389,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	Control House Addition (25-ft x 50-ft)	1	EA	\$ 325,000	\$ 325,000	\$ 85,000	\$ 85,000	\$ 410,000	\$ 410,000
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 12,500	\$ 37,500	\$ 47,500	\$ 142,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 130,900	\$ 130,900	\$ 130,900	\$ 130,900	\$ 261,800	\$ 261,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 560,900		\$ 253,400		\$ 814,300
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	LF	\$ 125.07	\$ -	\$ 237.10	\$ -	\$ 362	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 13.38	\$ 33,450	\$ 39.35	\$ 98,375	\$ 53	\$ 131,825
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	38	EA	\$ 2,000	\$ 76,000	\$ 1,050	\$ 39,900	\$ 3,050	\$ 115,900
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 62,500	\$ 62,500	\$ 75,000	\$ 75,000	\$ 137,500	\$ 137,500
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 90,000	\$ 90,000	\$ 108,000	\$ 108,000	\$ 198,000	\$ 198,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 409,950		\$ 457,275		\$ 867,225
<b>J. Pleasant Valley Substation - Install</b>					\$ 1,647,952		\$ 1,150,000		\$ 2,797,952
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 174,493	\$ 174,493	\$ 174,493	\$ 174,493
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 223,836	\$ 223,836	\$ 223,836	\$ 223,836
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 19,586	\$ 19,586	\$ 19,586	\$ 19,586

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 69,949	\$ 69,949	\$ 69,949	\$ 69,949
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 8,394	\$ 8,394	\$ 8,394	\$ 8,394
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 131,836	\$ 131,836	\$ -	\$ -	\$ 131,836	\$ 131,836
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,798	\$ 2,798	\$ 2,798	\$ 2,798
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 131,836		\$ 596,994		\$ 728,830

**NextEra T023 (Segment B Alternate)**

**Interconnection Knickerbocker Station**

Estimate Revision: **8**

Total: \$ **1,827,190**

*NextEra T023 (Segment B Alternate)*

	Supply	Installation	Total
<b>L. Interconnection Knickerbocker Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 436,850	\$ 436,850
2. FOUNDATIONS	\$ 238,638	\$ 241,194	\$ 479,832
3. STRUCTURES	\$ 313,836	\$ 219,711	\$ 533,547
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 58,150	\$ 26,466	\$ 84,616
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 48,850	\$ 243,495	\$ 292,345
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 659,474	\$ 1,167,716	\$ 1,827,190
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 659,474	\$ 1,167,716	\$ 1,827,190

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Knickerbocker Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	35,000.0	SF	\$ -	\$ -	\$ 4	\$ 123,200	\$ 4	\$ 123,200
1.10	Restoration for Work Pad areas	7,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,050	\$ 0	\$ 1,050
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 436,850		\$ 436,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV THREE POLE TAP, STEEL	2	Structures	\$ 119,319	\$ 238,638	\$ 120,597	\$ 241,194	\$ 239,916	\$ 479,832
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 238,638		\$ 241,194		\$ 479,832
<b>3. STRUCTURES</b>									
3.1	345KV THREE POLE TAP, STEEL	2	Structure	\$ 155,400	\$ 310,800	\$ 93,240	\$ 186,480	\$ 248,640	\$ 497,280
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	6	Pole	\$ 506	\$ 3,036	\$ 5,539	\$ 33,231	\$ 6,045	\$ 36,267
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 313,836		\$ 219,711		\$ 533,547
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 1.033kcmil 54/7 ACSS "Curlew"	-	LF	\$ 2.82	\$ -	\$ 5.00	\$ -	\$ 7.82	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	30	Assembly	\$ 1,800	\$ 54,000	\$ 720	\$ 21,600	\$ 2,520	\$ 75,600
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.6	OPGW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.7	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.8	OHSW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.9	OPGW Splice Boxes	1	Set	\$ 1,750	\$ 1,750	\$ 1,746	\$ 1,746	\$ 3,496	\$ 3,496
5.10	OPGW Splice & Test	1	EA	\$ 1,400	\$ 1,400	\$ 2,520	\$ 2,520	\$ 3,920	\$ 3,920
5.11	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.12	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.16									
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 58,150		\$ 26,466		\$ 84,616
<b>L. Interconnection Knickerbocker Station</b>					\$ 610,624		\$ 924,221		\$ 1,534,845
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 15,348	\$ 15,348	\$ 15,348	\$ 15,348
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 95,720	\$ 95,720	\$ 95,720	\$ 95,720
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 15,348	\$ 15,348	\$ 15,348	\$ 15,348
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 15,348	\$ 15,348	\$ 15,348	\$ 15,348
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 76,742	\$ 76,742	\$ 76,742	\$ 76,742
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 4,605	\$ 4,605	\$ 4,605	\$ 4,605
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 10,744	\$ 10,744	\$ 10,744	\$ 10,744
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 40,000	\$ -	\$ 40,000	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 4,605	\$ 4,605	\$ 4,605	\$ 4,605
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 48,850	\$ 48,850	\$ -	\$ -	\$ 48,850	\$ 48,850
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 1,535	\$ 1,535	\$ 1,535	\$ 1,535
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 48,850		\$ 243,495		\$ 292,345

**NextEra T023 (Segment B Alternate)**

**M. Interconnection Churchtown Station**

Estimate  
Revision: **8**

**Total: \$ 5,182,778**

NextEra T023 (Segment B Alternate)			
	Supply	Installation	Total
<b>M. Interconnection Churchtown Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 712,850	\$ 712,850
2. FOUNDATIONS	\$ 758,142	\$ 859,756	\$ 1,617,898
3. STRUCTURES	\$ 838,481	\$ 581,612	\$ 1,420,092
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 416,550	\$ 172,266	\$ 588,816
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 161,054	\$ 682,068	\$ 843,122
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 2,174,226</b>	<b>\$ 3,008,553</b>	<b>\$ 5,182,778</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 2,174,226</b>	<b>\$ 3,008,553</b>	<b>\$ 5,182,778</b>

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Churchtown Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	1,425.0	LF	\$ -	\$ -	\$ 70	\$ 99,750	\$ 70	\$ 99,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	95,000.0	SF	\$ -	\$ -	\$ 4	\$ 334,400	\$ 4	\$ 334,400
1.10	Restoration for Work Pad areas	19,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 2,850	\$ 0	\$ 2,850
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>				\$ -	\$ -	\$ 712,850	\$ 712,850	\$ -	\$ 712,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345KV S/C DEADEND, STEEL	15	Structures	\$ 50,543	\$ 758,142	\$ 30,650	\$ 459,756	\$ 81,193	\$ 1,217,898
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	200	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 758,142		\$ 859,756		\$ 1,617,898
<b>3. STRUCTURES</b>									
3.1	345KV S/C DEADEND, STEEL	15	Structure	\$ 55,393	\$ 830,891	\$ 33,236	\$ 498,534	\$ 88,628	\$ 1,329,425
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	15	Pole	\$ 506	\$ 7,590	\$ 5,539	\$ 83,078	\$ 6,045	\$ 90,668
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 838,481		\$ 581,612		\$ 1,420,092
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EH57 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 795kcmil 26/7 ACSS "Drake"	-	LF	\$ 1.72	\$ -	\$ 5.00	\$ -	\$ 6.72	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	225	Assembly	\$ 1,800	\$ 405,000	\$ 720	\$ 162,000	\$ 2,520	\$ 567,000
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5	OPGW Assembly - Tangent	16	Assembly	\$ 200	\$ 3,200	\$ 150	\$ 2,400	\$ 350	\$ 5,600
5.6	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.7	OHSW Assembly - Tangent	16	Assembly	\$ 200	\$ 3,200	\$ 150	\$ 2,400	\$ 350	\$ 5,600
5.8	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.9	OPGW Splice Boxes	1	Set	\$ 1,750	\$ 1,750	\$ 1,746	\$ 1,746	\$ 3,496	\$ 3,496
5.10	OPGW Splice & Test	1	EA	\$ 1,400	\$ 1,400	\$ 2,520	\$ 2,520	\$ 3,920	\$ 3,920
5.11	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.12	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.16					\$ -		\$ -		\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 416,550		\$ 172,266		\$ 588,816
<b>M. Interconnection Churchtown Station</b>					\$ 2,013,172		\$ 2,326,484		\$ 4,339,656
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 43,397	\$ 43,397	\$ 43,397	\$ 43,397
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 270,641	\$ 270,641	\$ 270,641	\$ 270,641
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 43,397	\$ 43,397	\$ 43,397	\$ 43,397
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 43,397	\$ 43,397	\$ 43,397	\$ 43,397
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 216,983	\$ 216,983	\$ 216,983	\$ 216,983
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 13,019	\$ 13,019	\$ 13,019	\$ 13,019
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 30,378	\$ 30,378	\$ 30,378	\$ 30,378
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 40,000	\$ -	\$ 40,000	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 13,019	\$ 13,019	\$ 13,019	\$ 13,019
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 161,054	\$ 161,054	\$ -	\$ -	\$ 161,054	\$ 161,054
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 4,340	\$ 4,340	\$ 4,340	\$ 4,340
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 161,054		\$ 682,068		\$ 843,122

**NextEra T023 (Segment B Alternate)**

**N. Interconnection Milan Station**

Estimate Revision: **8** Total: \$ **714,622**

<i>NextEra T023 (Segment B Alternate)</i>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>N. Interconnection Milan Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 121,100	\$ 121,100
2. FOUNDATIONS	\$ 84,375	\$ 135,279	\$ 219,654
3. STRUCTURES	\$ 130,328	\$ 88,667	\$ 218,994
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 27,200	\$ 11,280	\$ 38,480
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 19,352	\$ 97,042	\$ 116,394
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 261,255</b>	<b>\$ 453,367</b>	<b>\$ 714,622</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 261,255</b>	<b>\$ 453,367</b>	<b>\$ 714,622</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Milan Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	1.0	Acre	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	500.0	LF	\$ -	\$ -	\$ 4	\$ 2,000	\$ 4	\$ 2,000
1.5	Matting - Access and ROW	500.0	LF	\$ -	\$ -	\$ 70	\$ 35,000	\$ 70	\$ 35,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	10,000.0	SF	\$ -	\$ -	\$ 4	\$ 35,200	\$ 4	\$ 35,200
1.10	Restoration for Work Pad areas	2,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 300	\$ 0	\$ 300
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ -	\$ 121,100	\$ -	\$ 121,100
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit Single Pole Angle/DE	2	EA	\$ 42,187	\$ 84,375	\$ 42,639	\$ 85,279	\$ 84,827	\$ 169,654
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	25	CY	\$ -	\$ -	\$ 2,000	\$ 50,000	\$ 2,000	\$ 50,000
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 84,375		\$ 135,279		\$ 219,654
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	2	Structure	\$ 64,658	\$ 129,316	\$ 38,795	\$ 77,590	\$ 103,453	\$ 206,905
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	2	Pole	\$ 506	\$ 1,012	\$ 5,539	\$ 11,077	\$ 6,045	\$ 12,089
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 130,328		\$ 88,667		\$ 218,994
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 560	\$ -	\$ 2,360	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	14	Assembly	\$ 1,800	\$ 25,200	\$ 720	\$ 10,080	\$ 2,520	\$ 35,280
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5					\$ -		\$ -		\$ -
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 27,200		\$ 11,280		\$ 38,480
<b>N. Interconnection Milan Station</b>					\$ 241,903		\$ 356,325		\$ 598,228
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 5,982	\$ 5,982	\$ 5,982	\$ 5,982

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 37,308	\$ 37,308	\$ 37,308	\$ 37,308
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 5,982	\$ 5,982	\$ 5,982	\$ 5,982
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 5,982	\$ 5,982	\$ 5,982	\$ 5,982
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 29,911	\$ 29,911	\$ 29,911	\$ 29,911
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 1,795	\$ 1,795	\$ 1,795	\$ 1,795
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 4,188	\$ 4,188	\$ 4,188	\$ 4,188
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,795	\$ 1,795	\$ 1,795	\$ 1,795
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 19,352	\$ 19,352	\$ -	\$ -	\$ 19,352	\$ 19,352
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 598	\$ 598	\$ 598	\$ 598
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 19,352		\$ 97,042		\$ 116,394

**NextEra - T023 - (Segment B)**

**O. NUF to mitigate NY to NE interface transfer limit degradation**

Estimate  
Revision: **0**

**Total: \$ 26,785,714**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>SUF 1</b>	<b>Transmission Line Upgrade Cricket Valley - Connecticut Border to Long Mountain</b>								
1.1	Line Upgrade	1.00	LS		\$ -		\$ -	\$ 21,428,571	\$ 21,428,571
	<b>Subtotal SUG 1 Direct Cost</b>				\$ -		\$ -		\$ 21,428,571
2	Engineering, T&C, PM, Indirects (25%)				\$ -		\$ -		\$ 5,357,143
	<b>TOTAL:</b>				\$ -		\$ -		\$ 26,785,714

**NextEra T023 (Segment B Alternate)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type. 20% of the total length of the line is assumed to use Type 1 Gravel road and 80% of the line length access to be used wood matting. In addition 75 feet of wood matting is included from the access matting to the work pad area matting. The estimate also include 5,000 square feet of wood matting for each structure work area within the ROW. For the ground restoration (seed, straw and woven mat), 20% of the work pad area included.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 5.423% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	From Churchtown to Pleasant Valley; Churchtown loop around 345kV conductor 0.3 miles have been added.
25	An additional Quantity of 5% have been added to conductors, OPGW, & OHSW for sag and jumpers.
26	Rock excavation not provided in proposal foundation data, most of the foundation are concrete pole direct embedded, rock excavation assumed 50% for T022 (Churchtown to Pleasant Valley) and rest 75% of quantities of National Grid's proposal.
27	Cricket Valley to Long Mountain line upgrade: Network Upgrade (NUF) costs to mitigate NY to NE interface transfer limit degradation were based on possible solutions identified during the June 2018 SIS process
28	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.



NY Power Authority and North American Transmission (T029)			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$34,313
	1.2	Foundations	\$17,769
	1.3	Structures	\$52,916
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$30,069
	1.5	Insulators, Fitting and Hardwares	\$11,442
	Subtotal (1)		<b>\$146,509</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$14,982
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$2,226
	2.4	Churchtown Substation	\$15,925
	2.5	Pleasant Valley Substation	\$2,798
	2.6	Substation Interconnections	\$5,495
Subtotal (2)		<b>\$41,487</b>	
Total (1+2)		\$187,996	
Contractors Mark-up (15% of Total 1+2)		\$28,199	
Total Direct Cost (A)		<b>\$216,196</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$1,880
	3.2	Project Management, Material Handling & Amenities	\$15,363
	3.3	Engineering	\$12,524
	3.4	Testing & Commissioning	\$973
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$14,136
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
Total Indirect Cost (3)		<b>\$52,504</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$268,700</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	NUF proposed as element of the Project (Middletown Line and Terminal)	\$16,261
	4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000
Subtotal NUF Cost (C)		<b>\$46,261</b>	
Total Project Cost (B+C) 2017 \$		<b>\$314,961</b>	
Total Project Cost 2018 \$		<b>\$324,410</b>	

**NAT - NYPA - T029 - (Segment B)**

Estimate Revision: 8

<i>NAT - NYPA - T029 - (Segment B) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 53,833,887
Direct Labor, Material & Equipment Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 87,928,556
Direct Labor, Material & Equipment Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 4,746,361
Direct Labor, Material & Equipment Costs	D. Knickerbocker 345kV Substation - Install	\$ 14,982,000
Direct Labor, Material & Equipment Costs	E. Greenbush Substation - Removal	\$ 61,200
Direct Labor, Material & Equipment Costs	F. Schodack Substation - Install	\$ 2,089,357
Direct Labor, Material & Equipment Costs	G. Schodack Substation - Removal	\$ 136,200
Direct Labor, Material & Equipment Costs	H. Churchtown Substation - Install	\$ 15,046,621
Direct Labor, Material & Equipment Costs	I. Churchtown Substation - Removal	\$ 878,578
Direct Labor, Material & Equipment Costs	J. Pleasant Valley Substation - Install	\$ 2,797,952
Direct Labor, Material & Equipment Costs	K. Interconnection Milan Station	\$ 675,154
Direct Labor, Material & Equipment Costs	L. Interconnection Knickerbocker Station	\$ 1,206,222
Direct Labor, Material & Equipment Costs	M. Interconnection Churchtown Station	\$ 1,775,951
Direct Labor, Material & Equipment Costs	N. Interconnection Pleasant Valley Station	\$ 1,838,080
Direct Labor, Material & Equipment Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 21,428,571
Direct Labor, Material & Equipment Costs	P. NUF proposed as element of the Project (Middletown Line and Terminal)	\$ 11,615,000
<b>SUBTOTAL:</b>		<b>\$ 221,039,690</b>
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		<b>\$ 33,155,953</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>		<b>\$ -</b>
<b>TOTAL DIRECT:</b>		<b>\$ 254,195,643</b>

<i>NAT - NYPA - T029 - (Segment B) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 12,932,303
Indirect Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 20,756,469
Indirect Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 1,001,157
Indirect Costs	D. Rotterdam Substation - Install	\$ 3,969,250
Indirect Costs	E. Greenbush Substation - Removal	\$ 10,754
Indirect Costs	F. Schodack Substation - Install	\$ 531,867
Indirect Costs	G. Schodack Substation - Removal	\$ 23,933
Indirect Costs	H. Churchtown Substation - Install	\$ 3,765,943
Indirect Costs	I. Churchtown Substation - Removal	\$ 153,506
Indirect Costs	J. Pleasant Valley Substation - Install	\$ 727,028
Indirect Costs	K. Interconnection Milan Station	\$ 129,428
Indirect Costs	L. Interconnection Knickerbocker Station	\$ 218,560
Indirect Costs	M. Interconnection Churchtown Station	\$ 329,054
Indirect Costs	N. Interconnection Pleasant Valley Station	\$ 327,187
Indirect Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 5,357,143
Indirect Costs	P. NUF proposed as element of the Project (Middletown Line and Terminal)	\$ 2,904,000
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lic. & Permit., and Envir. Mitigation)	\$ 7,627,609
<b>TOTAL INDIRECT:</b>		<b>\$ 60,765,191</b>

**TOTAL ESTIMATED COST: \$ 314,960,834**

**NAT - NYPA - T029 - (Segment B)**

**A. Transmission Line Knickerbocker to Churchtown**

Estimate Revision: **8**

Total: \$ 66,766,190

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>A. Transmission Line Knickerbocker to Churchtown</b>			
1. CLEARING & ACCESS	\$ 11,500	\$ 13,264,953	\$ 13,276,453
2. FOUNDATIONS	\$ 1,222,467	\$ 5,948,438	\$ 7,170,905
3. STRUCTURES	\$ 7,893,794	\$ 9,965,095	\$ 17,858,889
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,367,420	\$ 8,759,465	\$ 11,126,885
5. INSULATORS, FITTINGS, HARDWARE	\$ 2,914,366	\$ 1,486,388	\$ 4,400,755
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,152,764	\$ 11,779,540	\$ 12,932,303
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 15,562,311</b>	<b>\$ 51,203,879</b>	<b>\$ 66,766,190</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 15,562,311</b>	<b>\$ 51,203,879</b>	<b>\$ 66,766,190</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Knickerbocker to Churchtown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	19	Acre	\$ -	\$ -	\$ 15,000	\$ 285,000	\$ 15,000	\$ 285,000
1.2	Clearing the ROW - Light (mowing)	63	Acre	\$ -	\$ -	\$ 5,000	\$ 315,000	\$ 5,000	\$ 315,000
1.3	Permanent Access Road	23,126	LF	\$ -	\$ -	\$ 45.00	\$ 1,040,688	\$ 45	\$ 1,040,688
1.4	Silt Fence	115,632	LF	\$ -	\$ -	\$ 4.00	\$ 462,528	\$ 4	\$ 462,528
1.5	Matting - Access and ROW	92,506	LF	\$ -	\$ -	\$ 70.00	\$ 6,475,392	\$ 70	\$ 6,475,392
1.6	Matting - To Work Area	12,075	LF	\$ -	\$ -	\$ 70.00	\$ 845,250	\$ 70	\$ 845,250
1.7	Snow Removal	21.9	Mile	\$ -	\$ -	\$ 16,000	\$ 350,400	\$ 16,000	\$ 350,400
1.8	ROW Restoration	21.9	Mile	\$ -	\$ -	\$ 10,000	\$ 219,000	\$ 10,000	\$ 219,000
1.9	Work Pads	805,000.0	SF	\$ -	\$ -	\$ 3.52	\$ 2,833,600	\$ 4	\$ 2,833,600
1.10	Restoration for Work Pad areas	161,000.0	SF	\$ -	\$ -	\$ 0.15	\$ 24,150	\$ 0	\$ 24,150
1.11	Temporary Access Bridge	9	EA	\$ -	\$ -	\$ 20,035	\$ 180,315	\$ 20,035	\$ 180,315
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	4	EA	\$ -	\$ -	\$ 4,580	\$ 18,320	\$ 4,580	\$ 18,320
1.14	Maintenance and Protection of Traffic on Public Roads	47	EA	\$ -	\$ -	\$ 4,130	\$ 194,110	\$ 4,130	\$ 194,110
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	2	EA	\$ 2,000	\$ 4,000	\$ 2,500	\$ 5,000	\$ 4,500	\$ 9,000
1.17	Concrete Washout Station	2	EA	\$ -	\$ -	\$ 1,850	\$ 3,700	\$ 1,850	\$ 3,700
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 11,500		\$ 13,264,953		\$ 13,276,453
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	EA	\$ 3,548	\$ 3,548	\$ 24,123	\$ 24,123	\$ 27,671	\$ 27,671
2.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	EA	\$ 2,929	\$ 2,929	\$ 19,916	\$ 19,916	\$ 22,844	\$ 22,844
2.3	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	7	EA	\$ 3,685	\$ 25,795	\$ 25,058	\$ 175,406	\$ 28,743	\$ 201,201
2.4	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	129	EA	\$ 2,720	\$ 350,859	\$ 18,495	\$ 2,385,840	\$ 21,215	\$ 2,736,698
2.5	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	3	EA	\$ 2,878	\$ 8,635	\$ 19,573	\$ 58,718	\$ 22,451	\$ 67,353
2.6	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	10	EA	\$ 3,193	\$ 31,928	\$ 21,711	\$ 217,107	\$ 24,903	\$ 249,035
2.7	1-CKT 345KV VERTICAL LARGE ANGLE DEADEND (60°-90°)	1	EA	\$ 118,078	\$ 118,078	\$ 119,343	\$ 119,343	\$ 237,421	\$ 237,421
2.8	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	EA	\$ 93,345	\$ 93,345	\$ 94,345	\$ 94,345	\$ 187,690	\$ 187,690
2.9	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	8	EA	\$ 73,419	\$ 587,351	\$ 74,205	\$ 593,641	\$ 147,624	\$ 1,180,993
2.10	Rock Excavation Adder	1,130.0	CY	\$ -	\$ -	\$ 2,000	\$ 2,260,000	\$ 2,000	\$ 2,260,000
2.11									
2.12									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.13									
2.14									
2.15									
2.16									
2.17									
2.18									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,222,467		\$ 5,948,438		\$ 7,170,905
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL LARGE ANGLE DEADEND (60°-90°)	1	Structure	\$ 239,760	\$ 239,760	\$ 143,856	\$ 143,856	\$ 383,616	\$ 383,616
3.2	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	Structure	\$ 116,328	\$ 116,328	\$ 69,797	\$ 69,797	\$ 186,125	\$ 186,125
3.3	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	Structure	\$ 103,156	\$ 103,156	\$ 61,894	\$ 61,894	\$ 165,050	\$ 165,050
3.4	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	Structure	\$ 50,024	\$ 50,024	\$ 30,014	\$ 30,014	\$ 80,038	\$ 80,038
3.5	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	8	Structure	\$ 125,416	\$ 1,003,329	\$ 75,250	\$ 601,997	\$ 200,666	\$ 1,605,326
3.6	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	7	Structure	\$ 73,812	\$ 516,687	\$ 44,287	\$ 310,012	\$ 118,100	\$ 826,698
3.7	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	129	Structure	\$ 39,107	\$ 5,044,765	\$ 23,464	\$ 3,026,859	\$ 62,571	\$ 8,071,624
3.8	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	3	Structure	\$ 54,248	\$ 162,745	\$ 32,549	\$ 97,647	\$ 86,797	\$ 260,391
3.9	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	10	Structure	\$ 57,554	\$ 575,535	\$ 34,532	\$ 345,321	\$ 92,086	\$ 920,856
3.10	Remove Existing Concrete Foundation	688	EA	\$ -	\$ -	\$ 3,250	\$ 2,236,000	\$ 3,250	\$ 2,236,000
3.11	Remove Existing Structure and Accessories	172	EA	\$ -	\$ -	\$ 12,500	\$ 2,150,000	\$ 12,500	\$ 2,150,000
3.12	Install Grounding and Grounding Accessories	161	Pole	\$ 506	\$ 81,466	\$ 5,539	\$ 891,699	\$ 6,045	\$ 973,165
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 7,893,794		\$ 9,965,095		\$ 17,858,889
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	741,787	LF	\$ 1.90	\$ 1,409,395	\$ 5.00	\$ 3,708,935	\$ 6.90	\$ 5,118,330
4.2	(1) OPGW 36 Fiber AC-33/38/571	123,631	LF	\$ 1.35	\$ 166,902	\$ 5.00	\$ 618,155	\$ 6.35	\$ 785,057
4.3	(1) 3/8" EHS7 Steel	121,414	LF	\$ 0.47	\$ 57,065	\$ 5.00	\$ 607,070	\$ 5.47	\$ 664,135
4.4	Remove Existing 115kv Cable From Existing Structures	43.8	Mile	\$ -	\$ -	\$ 30,000	\$ 1,314,000	\$ 30,000.00	\$ 1,314,000
4.5	Remove Existing OPGW Cable and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.6	Remove Existing OHSW and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.7	115kv - (1) 954kcmil 54/7 ACSS "Cardinal"	364,241	LF	\$ 1.90	\$ 692,058	\$ 5.00	\$ 1,821,205	\$ 6.90	\$ 2,513,263
4.8	Rider Poles (47 Locations)	24	Set	\$ 1,750	\$ 42,000	\$ 3,500	\$ 84,000	\$ 5,250.00	\$ 126,000
4.9	Rider Poles - Relocated	23	Set	\$ -	\$ -	\$ 3,500	\$ 80,500	\$ 3,500.00	\$ 80,500
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,367,420		\$ 8,759,465		\$ 11,126,885
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	705	Assembly	\$ 1,800	\$ 1,269,000	\$ 720	\$ 507,600	\$ 2,520	\$ 1,776,600
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	695	Assembly	\$ 900	\$ 625,500	\$ 560	\$ 389,200	\$ 1,460	\$ 1,014,700
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	300	Assembly	\$ 1,800	\$ 540,000	\$ 720	\$ 216,000	\$ 2,520	\$ 756,000
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	126	Assembly	\$ 900	\$ 113,400	\$ 560	\$ 70,560	\$ 1,460	\$ 183,960
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	141	Assembly	\$ 200	\$ 28,200	\$ 150	\$ 21,150	\$ 350	\$ 49,350
5.7	OPGW Assembly - Angle / DE	40	Assembly	\$ 250	\$ 10,000	\$ 150	\$ 6,000	\$ 400	\$ 16,000
5.8	OHSW Assembly - Tangent	139	Assembly	\$ 200	\$ 27,800	\$ 150	\$ 20,850	\$ 350	\$ 48,650
5.9	OHSW Assembly - Angle / DE	36	Assembly	\$ 250	\$ 9,000	\$ 150	\$ 5,400	\$ 400	\$ 14,400
5.10	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
5.11	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.12	Spacer - Conductor	3,651	EA	\$ 50	\$ 182,550	\$ 35	\$ 127,785	\$ 85	\$ 310,335
5.13	Vibration Dampers - Conductor	1,314	EA	\$ 35	\$ 45,990	\$ 35	\$ 45,990	\$ 70	\$ 91,980
5.14	Shield wire / OPGW Dampers, Misc. Fittings	442	EA	\$ 27	\$ 11,934	\$ 35	\$ 15,470	\$ 62	\$ 27,404
5.15									
5.16		-	Set		\$ -		\$ -	\$ -	\$ -
5.17		-	Set		\$ -		\$ -	\$ -	\$ -
5.18									
5.19	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.20	Misc. materials (Signs and Markers)	21.9	Mile	\$ 770	\$ 16,863	\$ 1,006	\$ 22,031	\$ 1,776	\$ 38,894
5.21		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.22									
5.23									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 2,914,366		\$ 1,486,388		\$ 4,400,755
<b>A. Transmission Line Knickerbocker to Churchtown</b>					\$ 14,409,547		\$ 39,424,340		\$ 53,833,887
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 538,339	\$ 538,339	\$ 538,339	\$ 538,339
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,322,654	\$ 3,322,654	\$ 3,322,654	\$ 3,322,654
6.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 538,339	\$ 538,339	\$ 538,339	\$ 538,339
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 538,339	\$ 538,339	\$ 538,339	\$ 538,339
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,691,694	\$ 2,691,694	\$ 2,691,694	\$ 2,691,694
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 161,502	\$ 161,502	\$ 161,502	\$ 161,502
6.7	Geotech	25	Location	\$ -	\$ -	\$ 3,500	\$ 87,500	\$ 3,500	\$ 87,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 376,837	\$ 376,837	\$ 376,837	\$ 376,837
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 161,502	\$ 161,502	\$ 161,502	\$ 161,502
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 3,269,000	\$ 3,269,000	\$ 3,269,000	\$ 3,269,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,152,764	\$ 1,152,764	\$ -	\$ -	\$ 1,152,764	\$ 1,152,764
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 53,834	\$ 53,834	\$ 53,834	\$ 53,834
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,152,764		\$ 11,779,540		\$ 12,932,303

**NAT - NYPA - T029 - (Segment B)**

**B. Transmission Line Churchtown to Pleasant Valley**

Estimate  
Revision: 8

Total: \$ 108,685,025

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>B. Transmission Line Churchtown to Pleasant Valley</b>			
1. CLEARING & ACCESS	\$ 14,000	\$ 19,618,466	\$ 19,632,466
2. FOUNDATIONS	\$ 832,267	\$ 8,602,686	\$ 9,434,954
3. STRUCTURES	\$ 11,844,213	\$ 21,669,343	\$ 33,513,556
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 3,505,234	\$ 14,965,085	\$ 18,470,319
5. INSULATORS, FITTINGS, HARDWARE	\$ 4,562,919	\$ 2,314,342	\$ 6,877,261
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,660,691	\$ 19,095,779	\$ 20,756,469
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 22,419,324	\$ 86,265,701	\$ 108,685,025
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 22,419,324	\$ 86,265,701	\$ 108,685,025

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Churchtown to Pleasant Valley</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	9.0	Acre	\$ -	\$ -	\$ 15,000	\$ 135,000	\$ 15,000	\$ 135,000
1.2	Clearing the ROW - Light (mowing)	107.0	Acre	\$ -	\$ -	\$ 5,000	\$ 535,000	\$ 5,000	\$ 535,000
1.3	Access Road	34,108.8	LF	\$ -	\$ -	\$ 45	\$ 1,534,896	\$ 45	\$ 1,534,896
1.4	Silt Fence	170,544.0	LF	\$ -	\$ -	\$ 4	\$ 682,176	\$ 4	\$ 682,176
1.5	Matting - Access and ROW	136,435.2	LF	\$ -	\$ -	\$ 70	\$ 9,550,464	\$ 70	\$ 9,550,464
1.6	Matting - To Work Area	18,300.0	LF	\$ -	\$ -	\$ 70	\$ 1,281,000	\$ 70	\$ 1,281,000
1.7	Snow Removal	32.3	Mile	\$ -	\$ -	\$ 16,000	\$ 516,800	\$ 16,000	\$ 516,800
1.8	ROW Restoration	32.3	Mile	\$ -	\$ -	\$ 10,000	\$ 323,000	\$ 10,000	\$ 323,000
1.9	Work Pads	1,220,000.0	SF	\$ -	\$ -	\$ 4	\$ 4,294,400	\$ 4	\$ 4,294,400
1.10	Restoration for Work Pad areas	244,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 36,600	\$ 0	\$ 36,600
1.11	Temporary Access Bridge	14	EA	\$ -	\$ -	\$ 20,035	\$ 280,490	\$ 20,035	\$ 280,490
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	12	EA	\$ -	\$ -	\$ 4,580	\$ 54,960	\$ 4,580	\$ 54,960
1.14	Maintenance and Protection of Traffic on Public Roads	86	EA	\$ -	\$ -	\$ 4,130	\$ 355,180	\$ 4,130	\$ 355,180
1.15	Gates	4	EA	\$ 2,000	\$ 8,000	\$ 2,500	\$ 10,000	\$ 4,500	\$ 18,000
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 14,000		\$ 19,618,466		\$ 19,632,466
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	EA	\$ 3,548	\$ 3,548	\$ 21,427	\$ 21,427	\$ 24,974	\$ 24,974
2.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	EA	\$ 2,063	\$ 2,063	\$ 12,458	\$ 12,458	\$ 14,520	\$ 14,520
2.3	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	14	EA	\$ 3,120	\$ 43,684	\$ 18,846	\$ 263,850	\$ 21,967	\$ 307,534
2.4	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	187	EA	\$ 1,943	\$ 363,309	\$ 11,735	\$ 2,194,384	\$ 13,678	\$ 2,557,693
2.5	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	4	EA	\$ 2,073	\$ 8,291	\$ 12,520	\$ 50,079	\$ 14,593	\$ 58,370
2.6	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	29	EA	\$ 2,171	\$ 62,973	\$ 13,116	\$ 380,357	\$ 15,287	\$ 443,330
2.7	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	EA	\$ 32,046	\$ 32,046	\$ 32,390	\$ 32,390	\$ 64,436	\$ 64,436
2.8	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	7	EA	\$ 45,194	\$ 316,355	\$ 45,678	\$ 319,743	\$ 90,871	\$ 636,097
2.9	Rock Excavation Adder	2,664.0	CY	\$ -	\$ -	\$ 2,000	\$ 5,328,000	\$ 2,000	\$ 5,328,000
2.10									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.11									
2.12									
<b>TOTAL - FOUNDATIONS:</b>					\$ 832,267		\$ 8,602,686		\$ 9,434,954
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	Structure	\$ 103,156	\$ 103,156	\$ 61,894	\$ 61,894	\$ 165,050	\$ 165,050
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	Structure	\$ 73,094	\$ 73,094	\$ 43,856	\$ 43,856	\$ 116,950	\$ 116,950
3.3	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	14	Structure	\$ 78,909	\$ 1,104,728	\$ 47,345	\$ 662,837	\$ 126,255	\$ 1,767,564
3.4	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	187	Structure	\$ 39,764	\$ 7,435,835	\$ 23,858	\$ 4,461,501	\$ 63,622	\$ 11,897,335
3.5	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	4	Structure	\$ 51,227	\$ 204,906	\$ 30,736	\$ 122,944	\$ 81,962	\$ 327,850
3.6	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	29	Structure	\$ 59,830	\$ 1,735,060	\$ 35,898	\$ 1,041,036	\$ 95,727	\$ 2,776,095
3.7	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	Structure	\$ 127,558	\$ 127,558	\$ 76,535	\$ 76,535	\$ 204,092	\$ 204,092
3.8	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	7	Structure	\$ 133,774	\$ 936,415	\$ 80,264	\$ 561,849	\$ 214,038	\$ 1,498,263
3.9	Remove Existing Structure and Accessories	2,084	EA	\$ -	\$ -	\$ 3,250	\$ 6,773,000	\$ 3,250	\$ 6,773,000
3.10	Install Grounding and Grounding Accessories	521	EA	\$ -	\$ -	\$ 12,500	\$ 6,512,500	\$ 12,500	\$ 6,512,500
3.11	Install Grounding and Grounding Accessories	244	Pole	\$ 506	\$ 123,464	\$ 5,539	\$ 1,351,394	\$ 6,045	\$ 1,474,858
3.12									
3.13									
3.14									
3.15									
3.16									
3.17									
<b>TOTAL - STRUCTURES PRINCTOWN TO NEW SCOTLAND:</b>					\$ 11,844,213		\$ 21,669,343		\$ 33,513,556
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal"	1,087,733	LF	\$ 1.90	\$ 2,066,693	\$ 5.00	\$ 5,438,665	\$ 6.90	\$ 7,505,358
4.2	(1) OPGW 36 Fiber AC-33/38/571	181,289	LF	\$ 1.35	\$ 244,740	\$ 5.00	\$ 906,445	\$ 6.35	\$ 1,151,185
4.3	(1) 3/8" EHS7 Steel	181,289	LF	\$ 0.47	\$ 85,206	\$ 5.00	\$ 906,445	\$ 5.47	\$ 991,651
4.5	Remove Existing 115kV Cable From Existing Structures	130.4	Mile	\$ -	\$ -	\$ 30,000	\$ 3,912,000	\$ 30,000.00	\$ 3,912,000
4.6	Remove Existing OPGW Cable and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.7	Remove Existing OHSW and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.8	115KV - (1) 954kcmil 54/7 ACSS "Cardinal"	543,866	LF	\$ 1.90	\$ 1,033,345	\$ 5.00	\$ 2,719,330	\$ 6.90	\$ 3,752,675
4.9									
4.10	Rider Poles - Relocated	43	Set	\$ -	\$ -	\$ 3,500	\$ 150,500	\$ 3,500.00	\$ 150,500
4.11	Rider Poles (86 Total)	43	EA	\$ 1,750	\$ 75,250	\$ 3,500	\$ 150,500	\$ 5,250.00	\$ 225,750
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 3,505,234		\$ 14,965,085		\$ 18,470,319
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	1,035	Assembly	\$ 1,800	\$ 1,863,000	\$ 720	\$ 745,200	\$ 2,520	\$ 2,608,200
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	1,025	Assembly	\$ 900	\$ 922,500	\$ 560	\$ 574,000	\$ 1,460	\$ 1,496,500
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	555	Assembly	\$ 1,800	\$ 999,000	\$ 720	\$ 399,600	\$ 2,520	\$ 1,398,600
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	252	Assembly	\$ 900	\$ 226,800	\$ 560	\$ 141,120	\$ 1,460	\$ 367,920
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	207	Assembly	\$ 200	\$ 41,400	\$ 150	\$ 31,050	\$ 350	\$ 72,450
5.7	OPGW Assembly - Angle / DE	74	Assembly	\$ 250	\$ 18,500	\$ 150	\$ 11,100	\$ 400	\$ 29,600
5.8	OHSW Assembly - Tangent	205	Assembly	\$ 200	\$ 41,000	\$ 150	\$ 30,750	\$ 350	\$ 71,750
5.9	OHSW Assembly - Angle / DE	72	Assembly	\$ 250	\$ 18,000	\$ 150	\$ 10,800	\$ 400	\$ 28,800
5.10	OPGW Splice Boxes	12	Set	\$ 1,746	\$ 20,954	\$ 2,274	\$ 27,288	\$ 4,020	\$ 48,242
5.11	OPGW Splice & Test	12	EA	\$ 2,520	\$ 30,240	\$ 2,520	\$ 30,240	\$ 5,040	\$ 60,480
5.12	Spacer - Conductor	5,414	EA	\$ 50	\$ 270,700	\$ 35	\$ 189,490	\$ 85	\$ 460,190
5.13	Vibration Dampers - Conductor	1,949	EA	\$ 35	\$ 68,215	\$ 35	\$ 68,215	\$ 70	\$ 136,430
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	657	EA	\$ 27	\$ 17,739	\$ 35	\$ 22,995	\$ 62	\$ 40,734
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	32.3	Mile	\$ 770	\$ 24,871	\$ 1,006	\$ 32,494	\$ 1,776	\$ 57,365
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 4,562,919		\$ 2,314,342		\$ 6,877,261
<b>B. Transmission Line Churchtown to Pleasant Valley</b>					\$ 20,758,633		\$ 67,169,923		\$ 87,928,556

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. MOB/DEMOb, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 879,286	\$ 879,286	\$ 879,286	\$ 879,286
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 5,426,994	\$ 5,426,994	\$ 5,426,994	\$ 5,426,994
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 879,286	\$ 879,286	\$ 879,286	\$ 879,286
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 879,286	\$ 879,286	\$ 879,286	\$ 879,286
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 4,396,428	\$ 4,396,428	\$ 4,396,428	\$ 4,396,428
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 263,786	\$ 263,786	\$ 263,786	\$ 263,786
6.7	Geotech	33	Location	\$ -	\$ -	\$ 3,500	\$ 115,500	\$ 3,500	\$ 115,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 615,500	\$ 615,500	\$ 615,500	\$ 615,500
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 263,786	\$ 263,786	\$ 263,786	\$ 263,786
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 5,248,000	\$ 5,248,000	\$ 5,248,000	\$ 5,248,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,660,691	\$ 1,660,691	\$ -	\$ -	\$ 1,660,691	\$ 1,660,691
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 87,929	\$ 87,929	\$ 87,929	\$ 87,929
<b>TOTAL - MOB/DEMOb, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,660,691		\$ 19,095,779		\$ 20,756,469

**NG & NY Transco - T019 - (Segment B)**

**C. Blue Stores Junction to Blue Stores Substation**

Estimate Revision: **8**

Total: \$ **5,747,517**

NG & NY Transco - T019 - (Segment B)			
	Supply	Installation	Total
<b>C. Blue Stores Junction to Blue Stores Substation</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,404,512	\$ 1,404,512
2. FOUNDATIONS	\$ 236,848	\$ 925,954	\$ 1,162,802
3. STRUCTURES	\$ 596,484	\$ 946,665	\$ 1,543,149
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 84,763	\$ 387,095	\$ 471,858
5. INSULATORS, FITTINGS, HARDWARE	\$ 107,544	\$ 56,496	\$ 164,040
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 82,051	\$ 919,106	\$ 1,001,157
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
SUBTOTAL:	\$ 1,107,690	\$ 4,639,828	\$ 5,747,517
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
TOTAL:	\$ 1,107,690	\$ 4,639,828	\$ 5,747,517

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	4.0	Acre	\$ -	\$ -	\$ 5,000	\$ 20,000	\$ 5,000	\$ 20,000
1.3	Access Road	2,218	LF	\$ -	\$ -	\$ 45	\$ 99,792	\$ 45	\$ 99,792
1.4	Silt Fence	11,088.0	LF	\$ -	\$ -	\$ 4	\$ 44,352	\$ 4	\$ 44,352
1.5	Matting - Access and ROW	8,870	LF	\$ -	\$ -	\$ 70	\$ 620,928	\$ 70	\$ 620,928
1.6	Matting - To Work Area	1,800.0	LF	\$ -	\$ -	\$ 70	\$ 126,000	\$ 70	\$ 126,000
1.7	Snow Removal	2.1	Mile	\$ -	\$ -	\$ 16,000	\$ 33,600	\$ 16,000	\$ 33,600
1.8	ROW Restoration	2.1	Mile	\$ -	\$ -	\$ 10,000	\$ 21,000	\$ 10,000	\$ 21,000
1.9	Work Pads	120,000.0	SF	\$ -	\$ -	\$ 4	\$ 422,400	\$ 4	\$ 422,400
1.10	Restoration for Work Pad areas	24,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 3,600	\$ 0	\$ 3,600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	1	EA	\$ -	\$ -	\$ 4,580	\$ 4,580	\$ 4,580	\$ 4,580
1.14	Maintenance and Protection of Traffic on Public Roads	2	EA	\$ -	\$ -	\$ 4,130	\$ 8,260	\$ 4,130	\$ 8,260
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	-	EA	\$ -	\$ -	\$ 1,850	\$ -	\$ 1,850	\$ -
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ -		\$ 1,404,512		\$ 1,404,512
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	6	EA	\$ 31,225	\$ 187,348	\$ 31,559	\$ 189,354	\$ 62,784	\$ 376,702
2.2	Direct Embed - 115kV Single Circuit H- Pole Tangent	18	EA	\$ 2,750	\$ 49,500	\$ 18,700	\$ 336,600	\$ 21,450	\$ 386,100
2.3	Rock Excavation Adder	200.0	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 236,848		\$ 925,954		\$ 1,162,802
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit H- Pole Angle/ DE	6	Structure	\$ 39,822	\$ 238,929	\$ 23,893	\$ 143,358	\$ 63,714	\$ 382,287
3.2	115kV Single Circuit H- Pole Tangent	18	Structure	\$ 18,515	\$ 333,266	\$ 11,109	\$ 199,960	\$ 29,624	\$ 533,226
3.3	Remove Existing Structure and Accessories	-	EA	\$ -	\$ -	\$ 7,500	\$ -	\$ 7,500	\$ -
3.4	Install Grounding and Grounding Accessories	27	EA	\$ -	\$ -	\$ 12,500	\$ 337,500	\$ 12,500	\$ 337,500
3.5									
3.6	Install Grounding and Grounding Accessories	48	Pole	\$ 506	\$ 24,288	\$ 5,539	\$ 265,848	\$ 6,045	\$ 290,136
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 596,484		\$ 946,665		\$ 1,543,149
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSR "Cardinal"	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.4	115kV - (1) 795kcmil 26/7 ACSR "Drake"	34,927.0	LF	\$ 1.72	\$ 60,074	\$ 5.00	\$ 174,635	\$ 6.72	\$ 234,709
4.5	(1) OPGW 36 Fiber AC-33/38/571	11,642.0	LF	\$ 1.35	\$ 15,717	\$ 5.00	\$ 58,210	\$ 6.35	\$ 73,927
4.6	(1) 3/8" EHS7 Steel	11,642.0	LF	\$ 0.47	\$ 5,472	\$ 5.00	\$ 58,210	\$ 5.47	\$ 63,682
4.7	Remove Existing Cable	2.1	Mile	\$ -	\$ -	\$ 30,000	\$ 63,600	\$ 30,000.00	\$ 63,600
4.8	Remove Existing OPGW Cable and Accessories	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.9	Remove Existing OHSW and Accessories	2.1	Mile	\$ -	\$ -	\$ 12,000	\$ 25,440	\$ 12,000.00	\$ 25,440
4.10		-							
4.11		-							
4.12	Rider Poles (Locations)	2.0	EA	\$ 1,750	\$ 3,500	\$ 3,500	\$ 7,000	\$ 5,250.00	\$ 10,500
4.13									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 84,763		\$ 387,095		\$ 471,858
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	54	Assembly	\$ 900	\$ 48,600	\$ 360	\$ 19,440	\$ 1,260	\$ 68,040
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	36	Assembly	\$ 900	\$ 32,400	\$ 360	\$ 12,960	\$ 1,260	\$ 45,360
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.7	OPGW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.8	OHSW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.9	OHSW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.10	OPGW Splice Boxes	2	Set	\$ 1,746	\$ 3,492	\$ 2,274	\$ 4,548	\$ 4,020	\$ 8,040
5.11	OPGW Splice & Test	2	EA	\$ 2,520	\$ 5,040	\$ 2,520	\$ 5,040	\$ 5,040	\$ 10,080
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	72	EA	\$ 35	\$ 2,520	\$ 35	\$ 2,520	\$ 70	\$ 5,040
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	25	EA	\$ 27	\$ 675	\$ 35	\$ 875	\$ 62	\$ 1,550
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	2.1	Mile	\$ 770	\$ 1,617	\$ 1,006	\$ 2,113	\$ 1,776	\$ 3,730
5.17									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 107,544		\$ 56,496		\$ 164,040
<b>C. Blue Stores Junction to Blue Stores Substation</b>					\$ 1,025,639		\$ 3,720,722		\$ 4,746,361
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 292,948	\$ 292,948	\$ 292,948	\$ 292,948
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 237,318	\$ 237,318	\$ 237,318	\$ 237,318
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.7	Geotech	2	Location	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 33,225	\$ 33,225	\$ 33,225	\$ 33,225
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 153,000	\$ 153,000	\$ 153,000	\$ 153,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 82,051	\$ 82,051	\$ -	\$ -	\$ 82,051	\$ 82,051
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 4,746	\$ 4,746	\$ 4,746	\$ 4,746
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 82,051	\$ 919,106	\$ 919,106	\$ 919,106	\$ 1,001,157

**NAT - NYPA - T029 - (Segment B)**

**D. Knickerbocker 345kV Substation - Install**

Estimate Revision: **8**

Total: \$ **18,951,250**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>D. Knickerbocker 345kV Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 277,200	\$ 1,745,500	\$ 2,022,700
2. SUBSTATION FOUNDATIONS	\$ 1,467,421	\$ 1,581,150	\$ 3,048,571
3. SUBSTATION STRUCTURES	\$ 710,400	\$ 710,400	\$ 1,420,800
4. MAJOR EQUIPMENT	\$ 600,000	\$ 240,000	\$ 840,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,191,500	\$ 542,000	\$ 1,733,500
6. CONTROL HOUSE / PANELS	\$ 1,678,925	\$ 1,232,275	\$ 2,911,200
7. MISC ITEMS	\$ 1,114,327	\$ 1,890,902	\$ 3,005,229
8. MOB/DEMOP, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 563,182	\$ 3,406,069	\$ 3,969,250
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 7,602,955</b>	<b>\$ 11,348,296</b>	<b>\$ 18,951,250</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 7,602,955</b>	<b>\$ 11,348,296</b>	<b>\$ 18,951,250</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Knickerbocker 345kV Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	4.75	ACRES	\$ -	\$ -	\$ 230,000	\$ 1,092,500	\$ 230,000	\$ 1,092,500
1.2	Station stone within substation fence.	2,100	CY	\$ 27	\$ 56,700	\$ 75	\$ 157,500	\$ 102	\$ 214,200
1.3	Substation Fence	1,820	LF	\$ 100	\$ 182,000	\$ 100	\$ 182,000	\$ 200	\$ 364,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide	1,100	LF	\$ 35	\$ 38,500	\$ 285	\$ 313,500	\$ 320	\$ 352,000
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 277,200		\$ 1,745,500		\$ 2,022,700
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	6	EA	\$ 26,145	\$ 156,870	\$ 28,000	\$ 168,000	\$ 54,145	\$ 324,870
2.1e	Switch Stand Foundations	96	EA	\$ 4,482	\$ 430,272	\$ 4,800	\$ 460,800	\$ 9,282	\$ 891,072
2.1f	Station Service Transformer Stand Foundation	4	EA	\$ 4,482	\$ 17,928	\$ 4,800	\$ 19,200	\$ 9,282	\$ 37,128
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	63	EA	\$ 4,482	\$ 282,366	\$ 4,800	\$ 302,400	\$ 9,282	\$ 584,766
2.1j	Instrument Transformer Stand Foundations	27	EA	\$ 4,482	\$ 121,014	\$ 4,800	\$ 129,600	\$ 9,282	\$ 250,614
2.1k	Arrester Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1m	Wave Trap Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1n	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p									
2.1q									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 33,615	\$ 33,615	\$ 36,000	\$ 36,000	\$ 69,615	\$ 69,615
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 9,750	\$ 9,750	\$ 9,750	\$ 9,750
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	4	EA	\$ 5,229	\$ 20,916	\$ 5,600	\$ 22,400	\$ 10,829	\$ 43,316
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,467,421		\$ 1,581,150		\$ 3,048,571
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	2	EA	\$ 37,000	\$ 74,000	\$ 37,000	\$ 74,000	\$ 74,000	\$ 148,000
3.1c	Switch Stands	16	EA	\$ 14,800	\$ 236,800	\$ 14,800	\$ 236,800	\$ 29,600	\$ 473,600
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	63	EA	\$ 3,700	\$ 233,100	\$ 3,700	\$ 233,100	\$ 7,400	\$ 466,200
3.1g	Instrument Transformer Stand	27	EA	\$ 1,850	\$ 49,950	\$ 1,850	\$ 49,950	\$ 3,700	\$ 99,900
3.1h	Arrester Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1j	Wave Trap Stand	3	EA	\$ 7,400	\$ 22,200	\$ 7,400	\$ 22,200	\$ 14,800	\$ 44,400
3.1k	Misc. Structures	4	EA	\$ 6,475	\$ 25,900	\$ 6,475	\$ 25,900	\$ 12,950	\$ 51,800
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 710,400		\$ 710,400		\$ 1,420,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks with Reactors	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA			\$ 750,000	\$ -	\$ 750,000	\$ -
4.1e									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 600,000		\$ 240,000		\$ 840,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	3	EA	\$ 40,000	\$ 120,000	\$ 15,000	\$ 45,000	\$ 55,000	\$ 165,000
5.1b	Disconnect Switches - 3ph w/ manual operator	9	EA	\$ 35,000	\$ 315,000	\$ 17,500	\$ 157,500	\$ 52,500	\$ 472,500
5.1c	VT'S	9	EA	\$ 25,000	\$ 225,000	\$ 12,000	\$ 108,000	\$ 37,000	\$ 333,000
5.1d	CT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1e	CCVT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,191,500		\$ 542,000		\$ 1,733,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 286,650	\$ 286,650	\$ 85,000	\$ 85,000	\$ 371,650	\$ 371,650
6.2	Protection and Telecom Equipment Panels	15	EA	\$ 35,000	\$ 525,000	\$ 10,000	\$ 150,000	\$ 45,000	\$ 675,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 352,275	\$ 352,275	\$ 352,275	\$ 352,275	\$ 704,550	\$ 704,550
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,678,925		\$ 1,232,275		\$ 2,911,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,200.0	LF	\$ 185.00	\$ 222,000	\$ 170.00	\$ 204,000	\$ 355	\$ 426,000
7.2	Rigid Bus, Fittings & Insulators	3,000.0	LF	\$ 125.07	\$ 375,210	\$ 237.10	\$ 711,300	\$ 362	\$ 1,086,510
7.3	Strain Bus, Connectors & Insulators	0.0	LF	\$ 39.30	\$ -	\$ 53.35	\$ -	\$ 93	\$ -
7.4	Grounding System	16,900.0	LF	\$ 6.93	\$ 117,117	\$ 32.58	\$ 550,602	\$ 40	\$ 667,719
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,114,327		\$ 1,890,902		\$ 3,005,229
<b>D. Knickerbocker 345kV Substation - Install</b>					\$ 7,039,773		\$ 7,942,227		\$ 14,982,000
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 149,820	\$ 149,820	\$ 149,820	\$ 149,820
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 924,697	\$ 924,697	\$ 924,697	\$ 924,697
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 149,820	\$ 149,820	\$ 149,820	\$ 149,820
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 149,820	\$ 149,820	\$ 149,820	\$ 149,820
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,198,560	\$ 1,198,560	\$ 1,198,560	\$ 1,198,560
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 104,874	\$ 104,874	\$ 104,874	\$ 104,874
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 374,550	\$ 374,550	\$ 374,550	\$ 374,550
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 44,946	\$ 44,946	\$ 44,946	\$ 44,946

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 280,000	\$ 280,000	\$ 280,000	\$ 280,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 563,182	\$ 563,182	\$ -	\$ -	\$ 563,182	\$ 563,182
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 14,982	\$ 14,982	\$ 14,982	\$ 14,982
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 563,182		\$ 3,406,069		\$ 3,969,250

**NAT - NYPA - T029 - (Segment B)**

**I. Greenbush Substation - Removal**

Estimate Revision: **8**

Total: \$ **71,954**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>I. Greenbush Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 12,000	\$ 12,000
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ 7,000	\$ 7,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 35,000	\$ 35,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 7,200	\$ 7,200
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 10,754	\$ 10,754
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 71,954	\$ 71,954
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 71,954	\$ 71,954

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. Greenbush Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 7,200	\$ 7,200	\$ 7,200	\$ 7,200
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	2	EA	\$ -	\$ -	\$ 2,400	\$ 4,800	\$ 2,400	\$ 4,800
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 12,000		\$ 12,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	1	EA	\$ -	\$ -	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 7,000		\$ 7,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	2	EA	\$ -	\$ -	\$ 17,500	\$ 35,000	\$ 17,500	\$ 35,000
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 35,000		\$ 35,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	2	EA	\$ -	\$ -	\$ 3,600	\$ 7,200	\$ 3,600	\$ 7,200
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 7,200		\$ 7,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	EA	\$ -	\$ -	\$ 126.25	\$ -	\$ 126	\$ -
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>I. Greenbush Substation - Removal</b>					\$ -		\$ 61,200		\$ 61,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,777	\$ 3,777	\$ 3,777	\$ 3,777
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 612	\$ 612	\$ 612	\$ 612
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 4,896	\$ 4,896	\$ 4,896	\$ 4,896
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 428	\$ -	\$ 428	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 1,530	\$ -	\$ 1,530	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 184	\$ 184	\$ 184	\$ 184
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 61	\$ 61	\$ 61	\$ 61
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 10,754		\$ 10,754

**NAT - NYPA - T029 - (Segment B)**

**F. Schodack Substation - Install**

Estimate Revision: **8**

Total: \$ **2,621,224**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>F. Schodack Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 4,050	\$ 11,250	\$ 15,300
2. SUBSTATION FOUNDATIONS	\$ 201,690	\$ 216,000	\$ 417,690
3. SUBSTATION STRUCTURES	\$ 60,680	\$ 60,680	\$ 121,360
4. MAJOR EQUIPMENT	\$ 104,000	\$ 120,000	\$ 224,000
5. SMALL EQUIPMENT / MATERIALS	\$ 316,520	\$ 226,000	\$ 542,520
6. CONTROL HOUSE / PANELS	\$ 192,815	\$ 147,815	\$ 340,630
7. MISC ITEMS	\$ 168,552	\$ 259,305	\$ 427,857
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 83,865	\$ 448,002	\$ 531,867
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,132,172</b>	<b>\$ 1,489,052</b>	<b>\$ 2,621,224</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,132,172</b>	<b>\$ 1,489,052</b>	<b>\$ 2,621,224</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Schodack Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	150	CY	\$ 27	\$ 4,050	\$ 75	\$ 11,250	\$ 102	\$ 15,300
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 4,050		\$ 11,250		\$ 15,300
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 201,690	\$ 216,000	\$ 417,690		
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	4	EA	\$ 1,850	\$ 7,400	\$ 1,850	\$ 7,400	\$ 3,700	\$ 14,800
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	2	EA	\$ 3,700	\$ 7,400	\$ 3,700	\$ 7,400	\$ 7,400	\$ 14,800
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 60,680		\$ 60,680		\$ 121,360
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ 300,000	\$ -	\$ 80,000	\$ -	\$ 380,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	2	EA	\$ 52,000	\$ 104,000	\$ 60,000	\$ 120,000	\$ 112,000	\$ 224,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 104,000		\$ 120,000		\$ 224,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	6	EA	\$ 8,000	\$ 48,000	\$ 8,000	\$ 48,000	\$ 16,000	\$ 96,000
5.3f	Arresters	6	EA	\$ 3,420	\$ 20,520	\$ 6,000	\$ 36,000	\$ 9,420	\$ 56,520
5.3g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 316,520		\$ 226,000		\$ 542,520
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Protection and Telecom Equipment Panels	2	EA	\$ 35,000	\$ 70,000	\$ 12,500	\$ 25,000	\$ 47,500	\$ 95,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 122,815	\$ 122,815	\$ 122,815	\$ 122,815	\$ 245,630	\$ 245,630
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 192,815		\$ 147,815		\$ 340,630
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	530.0	LF	\$ 185.00	\$ 98,050	\$ 170.00	\$ 90,100	\$ 355	\$ 188,150
7.2	Rigid Bus, Fittings & Insulators	0.0	LF	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.3	Strain Bus, Connectors & Insulators	300.0	LF	\$ 39.30	\$ 11,790	\$ 53.35	\$ 16,005	\$ 93	\$ 27,795
7.4	Grounding System	800.0	LF	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	24	EA	\$ 1,000	\$ 24,000	\$ 550	\$ 13,200	\$ 1,550	\$ 37,200
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 168,552		\$ 259,305		\$ 427,857
<b>F. Schodack Substation - Install</b>					\$ 1,048,307		\$ 1,041,050		\$ 2,089,357
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 128,956	\$ 128,956	\$ 128,956	\$ 128,956
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 167,149	\$ 167,149	\$ 167,149	\$ 167,149
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,625	\$ 14,625	\$ 14,625	\$ 14,625
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,234	\$ 52,234	\$ 52,234	\$ 52,234
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,268	\$ 6,268	\$ 6,268	\$ 6,268
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 83,865	\$ 83,865	\$ -	\$ -	\$ 83,865	\$ 83,865
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,089	\$ 2,089	\$ 2,089	\$ 2,089
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 83,865		\$ 448,002		\$ 531,867

**NAT - NYPA - T029 - (Segment B)**

**G. Schodack Substation - Removal**

Estimate Revision: **8**

Total: \$ **160,133**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>G. Schodack Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 62,400	\$ 62,400
3. SUBSTATION STRUCTURES	\$ -	\$ 73,800	\$ 73,800
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 23,933	\$ 23,933
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 160,133	\$ 160,133
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 160,133	\$ 160,133

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Schodack Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Steel Transmission Pole Dead Ends (1ph.) Foundations	6	EA	\$ -	\$ -	\$ 10,400	\$ 62,400	\$ 10,400	\$ 62,400
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad (40'x125')	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 62,400		\$ 62,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	6	EA	\$ -	\$ -	\$ 12,300	\$ 73,800	\$ 12,300	\$ 73,800
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 73,800		\$ 73,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	LS	\$ -	\$ -	\$ 10,500.00	\$ -	\$ 10,500	\$ -
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>G. Schodack Substation - Removal</b>					\$ -		\$ 136,200		\$ 136,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 8,406	\$ 8,406	\$ 8,406	\$ 8,406
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 10,896	\$ 10,896	\$ 10,896	\$ 10,896
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	EA	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 953	\$ -	\$ 953	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 3,405	\$ -	\$ 3,405	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 409	\$ 409	\$ 409	\$ 409
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 136	\$ 136	\$ 136	\$ 136
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 23,933		\$ 23,933

**NAT - NYPA - T029 - (Segment B)**

**H. Churchtown Substation - Install**

Estimate Revision: **8**

Total: \$ **18,812,564**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>H. Churchtown Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 133,850	\$ 2,459,550	\$ 2,593,400
2. SUBSTATION FOUNDATIONS	\$ 964,690	\$ 1,039,500	\$ 2,004,190
3. SUBSTATION STRUCTURES	\$ 416,000	\$ 433,085	\$ 866,170
4. MAJOR EQUIPMENT	\$ 416,000	\$ 480,000	\$ 896,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,384,800	\$ 938,800	\$ 2,323,600
6. CONTROL HOUSE / PANELS	\$ 2,344,525	\$ 1,517,025	\$ 3,861,550
7. MISC ITEMS	\$ 1,013,691	\$ 1,488,020	\$ 2,501,711
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 535,251	\$ 3,230,692	\$ 3,765,943
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 7,208,807</b>	<b>\$ 11,586,672</b>	<b>\$ 18,812,564</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 7,208,807</b>	<b>\$ 11,586,672</b>	<b>\$ 18,812,564</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. Churchtown Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	2.0	ACRES	\$ -	\$ -	\$ 1,125,000	\$ 2,250,000	\$ 1,125,000	\$ 2,250,000
1.2	Station stone within substation fence.	900	CY	\$ 27	\$ 24,300	\$ 75	\$ 67,500	\$ 102	\$ 91,800
1.3	Substation Fence	1,050	LF	\$ 100	\$ 105,000	\$ 100	\$ 105,000	\$ 200	\$ 210,000
1.4	Permanent Access Road - 20'-Wide	130	LF	\$ 35	\$ 4,550	\$ 285	\$ 37,050	\$ 320	\$ 41,600
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 133,850		\$ 2,459,550		\$ 2,593,400
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	8	EA	\$ 5,229	\$ 41,832	\$ 5,600	\$ 44,800	\$ 10,829	\$ 86,632
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	20	EA	\$ 16,434	\$ 328,680	\$ 17,600	\$ 352,000	\$ 34,034	\$ 680,680
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	32	EA	\$ 2,988	\$ 95,616	\$ 3,200	\$ 102,400	\$ 6,188	\$ 198,016
2.3f	Fuse Stand Foundations	2	EA	\$ 2,988	\$ 5,976	\$ 3,200	\$ 6,400	\$ 6,188	\$ 12,376
2.3g	Bus Support 3ph Foundations	40	EA	\$ 2,988	\$ 119,520	\$ 3,200	\$ 128,000	\$ 6,188	\$ 247,520
2.3h	Bus Support 1 Ph Foundations	24	EA	\$ 2,988	\$ 71,712	\$ 3,200	\$ 76,800	\$ 6,188	\$ 148,512
2.3j	Instrument Transformer Stand Foundations	51	EA	\$ 2,988	\$ 152,388	\$ 3,200	\$ 163,200	\$ 6,188	\$ 315,588
2.3k	Arrester Stand Foundations	15	EA	\$ 2,988	\$ 44,820	\$ 3,200	\$ 48,000	\$ 6,188	\$ 92,820
2.3m	Wave Trap Stand Foundations	10	EA	\$ 2,988	\$ 29,880	\$ 3,200	\$ 32,000	\$ 6,188	\$ 61,880
2.3n	Station Service Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 33,615	\$ 33,615	\$ 36,000	\$ 36,000	\$ 69,615	\$ 69,615
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 1ph.	1	LS	\$ -	\$ -	\$ 6,500	\$ 6,500	\$ 6,500	\$ 6,500
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	4	EA	\$ 5,229	\$ 20,916	\$ 5,600	\$ 22,400	\$ 10,829	\$ 43,316
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 964,690		\$ 1,039,500		\$ 2,004,190
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	5	EA	\$ 18,500	\$ 92,500	\$ 18,500	\$ 92,500	\$ 37,000	\$ 185,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	16	EA	\$ 7,955	\$ 127,280	\$ 7,955	\$ 127,280	\$ 15,910	\$ 254,560
3.3d	Fuse Stand	1	EA	\$ 7,955	\$ 7,955	\$ 7,955	\$ 7,955	\$ 15,910	\$ 15,910
3.3e	Bus Support 3ph	20	EA	\$ 3,330	\$ 66,600	\$ 3,330	\$ 66,600	\$ 6,660	\$ 133,200
3.3f	Bus Support 1 Ph	24	EA	\$ 1,850	\$ 44,400	\$ 1,850	\$ 44,400	\$ 3,700	\$ 88,800
3.3g	Instrument Transformer Stand	51	EA	\$ 740	\$ 37,740	\$ 740	\$ 37,740	\$ 1,480	\$ 75,480
3.3h	Arrester Stand	15	EA	\$ 740	\$ 11,100	\$ 740	\$ 11,100	\$ 1,480	\$ 22,200
3.3j	Wave Trap Stand	5	EA	\$ 3,700	\$ 18,500	\$ 3,700	\$ 18,500	\$ 7,400	\$ 37,000
3.3k	Misc. Structures	4	EA	\$ 6,475	\$ 25,900	\$ 6,475	\$ 25,900	\$ 12,950	\$ 51,800
3.3l	Station Service Transformer Support Stand	1	EA	\$ 1,110	\$ 1,110	\$ 1,110	\$ 1,110	\$ 2,220	\$ 2,220
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 433,085		\$ 433,085		\$ 866,170
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ 300,000	\$ -	\$ 80,000	\$ -	\$ 380,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 250,000	\$ -	\$ 80,000	\$ -	\$ 330,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	8	EA	\$ 52,000	\$ 416,000	\$ 60,000	\$ 480,000	\$ 112,000	\$ 896,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 416,000		\$ 480,000		\$ 896,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	5	EA	\$ 33,000	\$ 165,000	\$ 15,000	\$ 75,000	\$ 48,000	\$ 240,000
5.3b	Disconnect Switches - 3ph w/ manual operator	16	EA	\$ 28,000	\$ 448,000	\$ 17,500	\$ 280,000	\$ 45,500	\$ 728,000
5.3c	VT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3d	CT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3e	CCVT'S	21	EA	\$ 8,000	\$ 168,000	\$ 8,000	\$ 168,000	\$ 16,000	\$ 336,000
5.3f	Arresters	15	EA	\$ 3,420	\$ 51,300	\$ 6,000	\$ 90,000	\$ 9,420	\$ 141,300
5.3g	Wave Traps	5	EA	\$ 13,000	\$ 65,000	\$ 8,000	\$ 40,000	\$ 21,000	\$ 105,000
5.3h	Station Service Transformers	1	EA	\$ 75,000	\$ 75,000	\$ 35,000	\$ 35,000	\$ 110,000	\$ 110,000
5.3j	Fuses	3	EA	\$ 7,500	\$ 22,500	\$ 3,600	\$ 10,800	\$ 11,100	\$ 33,300
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,384,800		\$ 938,800		\$ 2,323,600

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 292,500	\$ 292,500	\$ 85,000	\$ 85,000	\$ 377,500	\$ 377,500
6.2	Protection and Telecom Equipment Panels	30	EA	\$ 35,000	\$ 1,050,000	\$ 10,000	\$ 300,000	\$ 45,000	\$ 1,350,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 487,025	\$ 487,025	\$ 487,025	\$ 487,025	\$ 974,050	\$ 974,050
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,344,525		\$ 1,517,025		\$ 3,861,550
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,300.0	LF	\$ 185.00	\$ 240,500	\$ 170.00	\$ 221,000	\$ 355	\$ 461,500
7.2	Rigid Bus, Fittings & Insulators	1,800.0	LF	\$ 125.07	\$ 225,126	\$ 237.10	\$ 426,780	\$ 362	\$ 651,906
7.3	Strain Bus, Connectors & Insulators	1,000.0	LF	\$ 39.30	\$ 39,300	\$ 53.35	\$ 53,350	\$ 93	\$ 92,650
7.4	Grounding System	10,500.0	LF	\$ 6.93	\$ 72,765	\$ 32.58	\$ 342,090	\$ 40	\$ 414,855
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	36	EA	\$ 1,000	\$ 36,000	\$ 550	\$ 19,800	\$ 1,550	\$ 55,800
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,013,691		\$ 1,488,020		\$ 2,501,711
<b>H. Churchtown Substation - Install</b>					\$ 6,690,641		\$ 8,355,980		\$ 15,046,621
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 150,466	\$ 150,466	\$ 150,466	\$ 150,466
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 928,685	\$ 928,685	\$ 928,685	\$ 928,685
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 150,466	\$ 150,466	\$ 150,466	\$ 150,466
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 150,466	\$ 150,466	\$ 150,466	\$ 150,466
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,203,730	\$ 1,203,730	\$ 1,203,730	\$ 1,203,730
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 105,326	\$ 105,326	\$ 105,326	\$ 105,326

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 376,166	\$ 376,166	\$ 376,166	\$ 376,166
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 45,140	\$ 45,140	\$ 45,140	\$ 45,140
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 91,200	\$ 91,200	\$ 91,200	\$ 91,200
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 535,251	\$ 535,251	\$ -	\$ -	\$ 535,251	\$ 535,251
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 15,047	\$ 15,047	\$ 15,047	\$ 15,047
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 535,251		\$ 3,230,692		\$ 3,765,943

**NAT - NYPA - T029 - (Segment B)**

**I. Churchtown Substation - Removal**

Estimate Revision: **8**

Total: \$ **1,032,084**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>I. Churchtown Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 25,900	\$ 25,900
2. SUBSTATION FOUNDATIONS	\$ -	\$ 340,400	\$ 340,400
3. SUBSTATION STRUCTURES	\$ -	\$ 252,600	\$ 252,600
4. MAJOR EQUIPMENT	\$ -	\$ 24,600	\$ 24,600
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 60,000	\$ 60,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 25,078	\$ 25,078
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 153,506	\$ 153,506
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 1,032,084	\$ 1,032,084
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 1,032,084	\$ 1,032,084

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. Churchtown Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.		ACRES	\$ -	\$ -	\$ 250,000	\$ -	\$ 250,000	\$ -
1.2	Station stone within substation fence.		CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	740	LF	\$ -	\$ -	\$ 35	\$ 25,900	\$ 35	\$ 25,900
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 25,900		\$ 25,900
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1</b>	<b>345kV</b>								
2.1a	Circuit Breaker Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1n	Reactor Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations		EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations		EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations		EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	18	EA	\$ -	\$ -	\$ 5,200	\$ 93,600	\$ 5,200	\$ 93,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ -	\$ -	\$ 5,200	\$ 31,200	\$ 5,200	\$ 31,200
2.3j	Instrument Transformer Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Steel Transmission Pole Deadend Fnds (1Ph)	9	EA	\$ -	\$ -	\$ 15,000	\$ 135,000	\$ 15,000	\$ 135,000
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ 67,500	\$ -	\$ 67,500	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ -	\$ -	\$ 14,200	\$ 14,200	\$ 14,200	\$ 14,200
2.5b	Generator Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	4	EA	\$ -	\$ -	\$ 5,200	\$ 20,800	\$ 5,200	\$ 20,800
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 340,400		\$ 340,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1a	Substation A-Frame Structures - Stand alone		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone		EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column		EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands		EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph		EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2f	Bus Support 1 Ph		EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand		EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	9	EA	\$ -	\$ -	\$ 6,450	\$ 58,050	\$ 6,450	\$ 58,050
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	6	EA	\$ -	\$ -	\$ 6,450	\$ 38,700	\$ 6,450	\$ 38,700
3.3g	Instrument Transformer Stand	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Steel Transmission Pole Deadend (1Ph)	9	EA	\$ -	\$ -	\$ 12,300	\$ 110,700	\$ 12,300	\$ 110,700
3.4l	Lightning Mast	4	EA	\$ -	\$ -	\$ 6,450	\$ 25,800	\$ 6,450	\$ 25,800
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 252,600		\$ 252,600
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers		EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	2	EA	\$ -	\$ -	\$ 12,300	\$ 24,600	\$ 12,300	\$ 24,600
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 24,600		\$ 24,600

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3d	CT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3e	CCVT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 60,000		\$ 60,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	Protection and Telecom Equipment Panels		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.1	Conduit & Cable Trench System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	535.0	LF	\$ -	\$ -	\$ 46.88	\$ 25,078	\$ 47	\$ 25,078
7.3	Strain Bus, Connectors & Insulators		LF	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 25,078		\$ 25,078
<b>I. Churchtown Substation - Removal</b>					\$ -		\$ 878,578		\$ 878,578
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 8,786	\$ 8,786	\$ 8,786	\$ 8,786
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 54,226	\$ 54,226	\$ 54,226	\$ 54,226
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 8,786	\$ 8,786	\$ 8,786	\$ 8,786
8.4	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 8,786	\$ 8,786	\$ 8,786	\$ 8,786
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 70,286	\$ 70,286	\$ 70,286	\$ 70,286
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 6,150	\$ -	\$ 6,150	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 21,964	\$ -	\$ 21,964	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 2,636	\$ 2,636	\$ 2,636	\$ 2,636
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS			\$ 879	\$ -	\$ 879	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 153,506		\$ 153,506

**NAT - NYPA - T029 - (Segment B)**

**J. Pleasant Valley Substation - Install**

Estimate Revision: **8**

Total: \$ **3,524,980**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>J. Pleasant Valley Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 11,025	\$ 14,625	\$ 25,650
2. SUBSTATION FOUNDATIONS	\$ 161,177	\$ 171,300	\$ 332,477
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 260,500	\$ 129,000	\$ 389,500
6. CONTROL HOUSE / PANELS	\$ 560,900	\$ 253,400	\$ 814,300
7. MISC ITEMS	\$ 409,950	\$ 457,275	\$ 867,225
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 131,836	\$ 595,192	\$ 727,028
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,779,788	\$ 1,745,192	\$ 3,524,980
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,779,788	\$ 1,745,192	\$ 3,524,980

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Pleasant Valley Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	90	LF	\$ 100	\$ 9,000	\$ 100	\$ 9,000	\$ 200	\$ 18,000
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 11,025		\$ 14,625		\$ 25,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
					\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p									
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House Addition Foundation (25-ft x 50-ft)	1	EA	\$ 61,079	\$ 61,079	\$ 64,100	\$ 64,100	\$ 125,179	\$ 125,179
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 161,177		\$ 171,300		\$ 332,477
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ 52,000	\$ -	\$ 80,000	\$ -	\$ 132,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 225,000	\$ -	\$ 60,000	\$ -	\$ 285,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 8,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 260,500		\$ 129,000		\$ 389,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE Addition (25-ft x 50-ft)	1	EA	\$ 325,000	\$ 325,000	\$ 85,000	\$ 85,000	\$ 410,000	\$ 410,000
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 12,500	\$ 37,500	\$ 47,500	\$ 142,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 130,900	\$ 130,900	\$ 130,900	\$ 130,900	\$ 261,800	\$ 261,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 560,900		\$ 253,400		\$ 814,300
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	LS	\$ 15,008.40	\$ -	\$ 56,904.00	\$ -	\$ 71,912	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 13.38	\$ 33,450	\$ 39.35	\$ 98,375	\$ 53	\$ 131,825
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	38	EA	\$ 2,000	\$ 76,000	\$ 1,050	\$ 39,900	\$ 3,050	\$ 115,900
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 62,500	\$ 62,500	\$ 75,000	\$ 75,000	\$ 137,500	\$ 137,500
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 90,000	\$ 90,000	\$ 108,000	\$ 108,000	\$ 198,000	\$ 198,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 409,950		\$ 457,275		\$ 867,225
<b>J. Pleasant Valley Substation - Install</b>					\$ 1,647,952		\$ 1,150,000		\$ 2,797,952
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 172,691	\$ 172,691	\$ 172,691	\$ 172,691
8.3	Utility PM and Project Oversight	1	LS			\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 27,980	\$ 27,980	\$ 27,980	\$ 27,980
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 223,836	\$ 223,836	\$ 223,836	\$ 223,836
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 19,586	\$ 19,586	\$ 19,586	\$ 19,586
<b>Testing &amp; Commissioning</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 69,949	\$ 69,949	\$ 69,949	\$ 69,949
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 8,394	\$ 8,394	\$ 8,394	\$ 8,394
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 131,836	\$ 131,836	\$ -	\$ -	\$ 131,836	\$ 131,836
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,798	\$ 2,798	\$ 2,798	\$ 2,798
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 131,836		\$ 595,192		\$ 727,028

**NAT - NYPA - T029 - (Segment B)**

**N. Interconnection Milan Station**

Estimate Revision: **8** Total: \$ **804,582**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>N. Interconnection Milan Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 121,100	\$ 121,100
2. FOUNDATIONS	\$ 84,375	\$ 135,279	\$ 219,654
3. STRUCTURES	\$ 130,328	\$ 140,393	\$ 270,721
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 45,200	\$ 18,480	\$ 63,680
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 20,792	\$ 108,635	\$ 129,428
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 280,695</b>	<b>\$ 523,887</b>	<b>\$ 804,582</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 280,695</b>	<b>\$ 523,887</b>	<b>\$ 804,582</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Milan Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	1.0	Acre	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	500.0	LF	\$ -	\$ -	\$ 4	\$ 2,000	\$ 4	\$ 2,000
1.5	Matting - Access and ROW	500.0	LF	\$ -	\$ -	\$ 70	\$ 35,000	\$ 70	\$ 35,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	10,000.0	SF	\$ -	\$ -	\$ 4	\$ 35,200	\$ 4	\$ 35,200
1.10	Restoration for Work Pad areas	2,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 300	\$ 0	\$ 300
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 121,100		\$ 121,100
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit Single Pole Angle/DE	2	EA	\$ 42,187	\$ 84,375	\$ 42,639	\$ 85,279	\$ 84,827	\$ 169,654
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	25	CY	\$ -	\$ -	\$ 2,000	\$ 50,000	\$ 2,000	\$ 50,000
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 84,375		\$ 135,279		\$ 219,654
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	2	Structure	\$ 64,658	\$ 129,316	\$ 64,658	\$ 129,316	\$ 129,316	\$ 258,632
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	2	Pole	\$ 506	\$ 1,012	\$ 5,539	\$ 11,077	\$ 6,045	\$ 12,089
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 130,328		\$ 140,393		\$ 270,721
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	24	Assembly	\$ 1,800	\$ 43,200	\$ 720	\$ 17,280	\$ 2,520	\$ 60,480
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5									
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 45,200		\$ 18,480		\$ 63,680
<b>N. Interconnection Milan Station</b>					\$ 259,903		\$ 415,251		\$ 675,154
<b>6. MOB/DEMOb, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 6,752	\$ 6,752	\$ 6,752	\$ 6,752
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 41,671	\$ 41,671	\$ 41,671	\$ 41,671
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 6,752	\$ 6,752	\$ 6,752	\$ 6,752
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 6,752	\$ 6,752	\$ 6,752	\$ 6,752
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 33,758	\$ 33,758	\$ 33,758	\$ 33,758
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 2,025	\$ 2,025	\$ 2,025	\$ 2,025
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 4,726	\$ 4,726	\$ 4,726	\$ 4,726
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 2,025	\$ 2,025	\$ 2,025	\$ 2,025
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 20,792	\$ 20,792	\$ -	\$ -	\$ 20,792	\$ 20,792
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 675	\$ 675	\$ 675	\$ 675
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 20,792		\$ 108,635		\$ 129,428

**NAT - NYPA - T029 - (Segment B)**

**Interconnection Knickerbocker Station**

Estimate  
Revision: **8**

**Total: \$ 1,424,781**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>L. Interconnection Knickerbocker Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 482,850	\$ 482,850
2. FOUNDATIONS	\$ 87,988	\$ 184,454	\$ 272,441
3. STRUCTURES	\$ 222,873	\$ 180,838	\$ 403,710
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 29,466	\$ 17,754	\$ 47,220
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 27,226	\$ 191,333	\$ 218,560
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 367,553</b>	<b>\$ 1,057,229</b>	<b>\$ 1,424,781</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 367,553</b>	<b>\$ 1,057,229</b>	<b>\$ 1,424,781</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Knickerbocker Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	675.0	LF	\$ -	\$ -	\$ 70	\$ 47,250	\$ 70	\$ 47,250
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	45,000.0	SF	\$ -	\$ -	\$ 4	\$ 158,400	\$ 4	\$ 158,400
1.10	Restoration for Work Pad areas	9,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,350	\$ 0	\$ 1,350
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ 482,850	\$ 482,850	\$ 482,850	\$ 482,850
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 115KV 3-POLE TANGENT DEADEND (0°-5°)	6	EA	\$ 2,750	\$ 16,500	\$ 18,700	\$ 112,200	\$ 21,450	\$ 128,700
2.2	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	3	EA	\$ 23,829	\$ 71,488	\$ 24,085	\$ 72,254	\$ 47,914	\$ 143,741
2.3	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.4									
2.5									
2.6									
2.7									
2.8									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 87,988		\$ 184,454		\$ 272,441
<b>3. STRUCTURES</b>									
3.1	1-CKT 115KV 3-POLE TANGENT DEADEND (0°-5°)	2	Structure	\$ 67,803	\$ 135,605	\$ 40,682	\$ 81,363	\$ 108,484	\$ 216,968
3.2	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	1	Structure	\$ 82,714	\$ 82,714	\$ 49,628	\$ 49,628	\$ 132,342	\$ 132,342
3.3	Install Grounding and Grounding Accessories	9	Pole	\$ 506	\$ 4,554	\$ 5,539	\$ 49,847	\$ 6,045	\$ 54,401
3.4					\$ -		\$ -		\$ -
3.5									
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 222,873		\$ 180,838		\$ 403,710
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kv Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	12	Assembly	\$ 900	\$ 10,800	\$ 560	\$ 6,720	\$ 1,460	\$ 17,520
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	7	Assembly	\$ 1,800	\$ 12,600	\$ 720	\$ 5,040	\$ 2,520	\$ 17,640
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5									
5.6	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.7	OPGW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.8	OHSW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OHSW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.10	OPGW Splice Boxes	1	Set	\$ 1,746	\$ 1,746	\$ 2,274	\$ 2,274	\$ 4,020	\$ 4,020
5.11	OPGW Splice & Test	1	EA	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 5,040	\$ 5,040
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 29,466		\$ 17,754		\$ 47,220
<b>L. Interconnection Knickerbocker Station</b>					\$ 340,327		\$ 865,895		\$ 1,206,222
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
Contractor Mobilization / Demobilization									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 12,062	\$ 12,062	\$ 12,062	\$ 12,062
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 74,449	\$ 74,449	\$ 74,449	\$ 74,449
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 12,062	\$ 12,062	\$ 12,062	\$ 12,062
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 12,062	\$ 12,062	\$ 12,062	\$ 12,062
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 60,311	\$ 60,311	\$ 60,311	\$ 60,311
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 3,619	\$ 3,619	\$ 3,619	\$ 3,619
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 8,444	\$ 8,444	\$ 8,444	\$ 8,444
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 40,000	\$ -	\$ 40,000	\$ -
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 3,619	\$ 3,619	\$ 3,619	\$ 3,619
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 27,226	\$ 27,226	\$ -	\$ -	\$ 27,226	\$ 27,226
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 1,206	\$ 1,206	\$ 1,206	\$ 1,206
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 27,226		\$ 191,333		\$ 218,560

**NAT - NYPA - T029 - (Segment B)**

**M. Interconnection Churchtown Station**

Estimate  
Revision: **8**

Total: \$ **2,105,005**

NAT - NYPA - T029 - (Segment B)			
	Supply	Installation	Total
<b>M. Interconnection Churchtown Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 551,850	\$ 551,850
2. FOUNDATIONS	\$ 216,929	\$ 319,252	\$ 536,181
3. STRUCTURES	\$ 336,926	\$ 264,974	\$ 601,900
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 58,666	\$ 27,354	\$ 86,020
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 49,002	\$ 280,052	\$ 329,054
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>661,523</b>	\$ <b>1,443,482</b>	\$ <b>2,105,005</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>661,523</b>	\$ <b>1,443,482</b>	\$ <b>2,105,005</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Churchtown Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	900.0	LF	\$ -	\$ -	\$ 70	\$ 63,000	\$ 70	\$ 63,000
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	60,000.0	SF	\$ -	\$ -	\$ 4	\$ 211,200	\$ 4	\$ 211,200
1.10	Restoration for Work Pad areas	12,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,800	\$ 0	\$ 1,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 551,850		\$ 551,850
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	6	EA	\$ 18,077	\$ 108,464	\$ 18,271	\$ 109,626	\$ 36,348	\$ 218,090
2.2	2x 1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	6	EA	\$ 18,077	\$ 108,464	\$ 18,271	\$ 109,626	\$ 36,348	\$ 218,090
2.3	Rock Excavation Adder	50	CY	\$ -	\$ -	\$ 2,000	\$ 100,000	\$ 2,000	\$ 100,000
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 216,929		\$ 319,252		\$ 536,181
<b>3. STRUCTURES</b>									
3.1	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	2	Structure	\$ 82,714	\$ 165,427	\$ 49,628	\$ 99,256	\$ 132,342	\$ 264,683
3.2	2x 1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	2	Structure	\$ 82,714	\$ 165,427	\$ 49,628	\$ 99,256	\$ 132,342	\$ 264,683
3.3	Install Grounding and Grounding Accessories	12	Pole	\$ 506	\$ 6,072	\$ 5,539	\$ 66,462	\$ 6,045	\$ 72,534
3.4					\$ -		\$ -		\$ -
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES</b>					\$ 336,926		\$ 264,974		\$ 601,900
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9		-							
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	28	Assembly	\$ 1,800	\$ 50,400	\$ 720	\$ 20,160	\$ 2,520	\$ 70,560
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5		-	Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	8	Assembly	\$ 250	\$ 2,000	\$ 150	\$ 1,200	\$ 400	\$ 3,200
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	8	Assembly	\$ 250	\$ 2,000	\$ 150	\$ 1,200	\$ 400	\$ 3,200
5.10	OPGW Splice Boxes	1	Set	\$ 1,746	\$ 1,746	\$ 2,274	\$ 2,274	\$ 4,020	\$ 4,020
5.11	OPGW Splice & Test	1	EA	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 5,040	\$ 5,040
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20					\$ -		\$ -		\$ -
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 58,666		\$ 27,354		\$ 86,020
<b>M. Interconnection Churchtown Station</b>						\$ 612,521		\$ 1,163,430	\$ 1,775,951
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Job / Demob	1	LS	\$ -	\$ -	\$ 17,760	\$ 17,760	\$ 17,760	\$ 17,760
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 109,613	\$ 109,613	\$ 109,613	\$ 109,613
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 17,760	\$ 17,760	\$ 17,760	\$ 17,760
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 17,760	\$ 17,760	\$ 17,760	\$ 17,760
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 88,798	\$ 88,798	\$ 88,798	\$ 88,798
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 5,328	\$ 5,328	\$ 5,328	\$ 5,328
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,432	\$ 12,432	\$ 12,432	\$ 12,432
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 40,000	\$ -	\$ 40,000	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,328	\$ 5,328	\$ 5,328	\$ 5,328
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 49,002	\$ 49,002	\$ -	\$ -	\$ 49,002	\$ 49,002
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 1,776	\$ 1,776	\$ 1,776	\$ 1,776
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 49,002		\$ 280,052		\$ 329,054

**NAT - NYPA - T029 - (Segment B)**

**M. Interconnection Churchtown Station**

Estimate Revision: **8**

**Total: \$ 2,165,267**

<b>NAT - NYPA - T029 - (Segment B)</b>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>M. Interconnection Churchtown Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 620,850	\$ 620,850
2. FOUNDATIONS	\$ 16,088	\$ 415,395	\$ 431,483
3. STRUCTURES	\$ 346,603	\$ 286,485	\$ 633,088
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 105,566	\$ 47,094	\$ 152,660
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 37,460	\$ 289,727	\$ 327,187
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 505,717</b>	<b>\$ 1,659,551</b>	<b>\$ 2,165,267</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 505,717</b>	<b>\$ 1,659,551</b>	<b>\$ 2,165,267</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Churchtown Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	1,125.0	LF	\$ -	\$ -	\$ 70	\$ 78,750	\$ 70	\$ 78,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	75,000.0	SF	\$ -	\$ -	\$ 4	\$ 264,000	\$ 4	\$ 264,000
1.10	Restoration for Work Pad areas	15,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 2,250	\$ 0	\$ 2,250
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ 620,850		\$ 620,850	
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 115KV 3-POLE TANGENT DEADEND (0'-5")	15	EA	\$ 1,073	\$ 16,088	\$ 7,293	\$ 109,395	\$ 8,366	\$ 125,483
2.5	Rock Excavation Adder	153	CY	\$ -	\$ -	\$ 2,000	\$ 306,000	\$ 2,000	\$ 306,000
2.3									
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12									
2.13									
2.14									
2.15									
<b>TOTAL - FOUNDATIONS</b>					\$ 16,088		\$ 415,395		\$ 431,483
<b>3. STRUCTURES</b>									
3.1	1-CKT 115KV 3-POLE TANGENT DEADEND (0°-5°)	5	Structure	\$ 67,803	\$ 339,013	\$ 40,682	\$ 203,408	\$ 108,484	\$ 542,420
3.2	Install Grounding and Grounding Accessories	15	Pole	\$ 506	\$ 7,590	\$ 5,539	\$ 83,078	\$ 6,045	\$ 90,668
3.3									
3.4									
3.5									
3.6									
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES</b>					\$ 346,603		\$ 286,485		\$ 633,088
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 795kcmil 26/7 ACSS "Drake"	-	LF	\$ 1.72	\$ -	\$ 5.00	\$ -	\$ 6.72	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	105	Assembly	\$ 900	\$ 94,500	\$ 360	\$ 37,800	\$ 1,260	\$ 132,300
5.5		-	Assembly	\$ 900	\$ -	\$ 360	\$ -	\$ 1,260	\$ -
5.6	OPGW Assembly - Tangent	14	Assembly	\$ 200	\$ 2,800	\$ 150	\$ 2,100	\$ 350	\$ 4,900
5.7	OPGW Assembly - Angle / DE	1	Assembly	\$ 250	\$ 250	\$ 150	\$ 150	\$ 400	\$ 400
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	15	Assembly	\$ 250	\$ 3,750	\$ 150	\$ 2,250	\$ 400	\$ 6,000
5.10	OPGW Splice Boxes	1	Set	\$ 1,746	\$ 1,746	\$ 2,274	\$ 2,274	\$ 4,020	\$ 4,020
5.11	OPGW Splice & Test	1	EA	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 5,040	\$ 5,040
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19					\$ -		\$ -		\$ -
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 105,566		\$ 47,094		\$ 152,660
<b>M. Interconnection Churchtown Station</b>					\$ 468,256		\$ 1,369,824		\$ 1,838,080
<b>6. MOB/DEMOP, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Project Management, Material Handling & Amenities	1	LS	\$ -	\$ -	\$ 18,381	\$ 18,381	\$ 18,381	\$ 18,381

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 113,447	\$ 113,447	\$ 113,447	\$ 113,447
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 18,381	\$ 18,381	\$ 18,381	\$ 18,381
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 18,381	\$ 18,381	\$ 18,381	\$ 18,381
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 91,904	\$ 91,904	\$ 91,904	\$ 91,904
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 5,514	\$ 5,514	\$ 5,514	\$ 5,514
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 12,867	\$ 12,867	\$ 12,867	\$ 12,867
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 40,000	\$ -	\$ 40,000	\$ -
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,514	\$ 5,514	\$ 5,514	\$ 5,514
6.13	Real Estate Costs (New ROW)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 37,460	\$ 37,460	\$ -	\$ -	\$ 37,460	\$ 37,460
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 1,838	\$ 1,838	\$ 1,838	\$ 1,838
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 37,460		\$ 289,727		\$ 327,187

**NAT & NYPA - T029 - (Segment B)**

**O. NUF to mitigate NY to NE interface transfer limit degradation**

Estimate  
Revision: **8**

**Total: \$ 26,785,714**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>SUF 1</b>	<b>Transmission Line Upgrade Cricket Valley - Connecticut Border to Long Mountain</b>								
1.1	Line Upgrade	1.00	LS		\$ -		\$ -	\$ 21,428,571	\$ 21,428,571
	<b>Subtotal SUF 1 Direct Cost</b>				\$ -		\$ -		\$ 21,428,571
1.2	Engineering, T&C, PM, Indirects (25%)				\$ -		\$ -		\$ 5,357,143
	<b>TOTAL:</b>				\$ -		\$ -		\$ 26,785,714

**NAT - NYPA - T029 - (Segment B)**

**P. NUF proposed as element of the Project (Middletown Line and Terminal)**

Estimate  
Revision: **8**

**Total: \$ 14,519,000**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
SUF SS1	Middletown Tap Transformer Replacement	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 10,878,348	\$ 10,879,000
SUF SS1	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 360,000	\$ 360,000
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 2,810,000
<b>SUF SS1</b>	<b>SUF SS1 - TOTAL:</b>				<b>\$ -</b>		<b>\$ -</b>		<b>\$ 14,049,000</b>
SUF SS2	Middletown Line Upgrade	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS2	138kV - (1) 1113kcmil 45/7 ACSS "Bluejay" Conductor	29,272.32	LF	\$ 4.00	\$ 117,089	\$ 5.00	\$ 146,362	\$ 9	\$ 263,451
SUF SS2	Remove Existing 1033.5kml ACSR "Ortalon" Conductor and Accessories	0.88	Mile	\$ -	\$ -	\$ 30,000.00	\$ 26,400	\$ 30,000	\$ 26,400
SUF SS2	Rider Poles	3.00	Sets	\$ 1,750.00	\$ 5,250	\$ 3,500.00	\$ 10,500	\$ 5,250	\$ 15,750
SUF SS2	138kV Vertical Tangent Insulator Assembly	18.00	Assembly	\$ 900.00	\$ 16,200	\$ 560.00	\$ 10,080	\$ 1,460	\$ 26,280
SUF SS2	138kV Deadend Insulator Assembly	30.00	Assembly	\$ 900.00	\$ 27,000	\$ 560.00	\$ 16,800	\$ 1,460	\$ 43,800
SUF SS2	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 94,000
<b>SUF SS2</b>	<b>SUFSS 2 - TOTAL:</b>				<b>\$ 165,539</b>		<b>\$ 210,142</b>		<b>\$ 469,681</b>
	<b>STATIONS SUF DIRECT TOTAL:</b>								<b>\$ 11,615,000</b>
	<b>STATIONS SUF INDIRECT TOTAL:</b>								<b>\$ 2,904,000</b>
	<b>STATIONS SUF TOTAL</b>								<b>\$ 14,519,000</b>

**NAT - NYPA - T029 - (Segment B)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type. 20% of the total length of the line is assumed to use Type 1 Gravel road and 80% of the line length access to be used wood matting. In addition 75 feet of wood matting is included from the access matting to the work pad area matting. The estimate also include 5,000 square feet of wood matting for each structure work area within the ROW. For the ground restoration (seed, straw and woven mat), 20% of the work pad area included.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 5.367% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	Knickerbocker to Churchtown substation; 0.4 miles of 345kV conductor from the junction have been added.
25	An additional Quantity of 5% have been added to conductors, OPGW, & OHSW for sag and jumpers.
26	Rock excavation depth in Foundation data provided in the proposal.
27	Middletown to Shoemaker Line upgrade: The length of the line segment is 0.88 miles -The re-conductor will remove the existing 2 bundle 1033.5 ACSR conductor and install new 2 bundle Bluejay 1113 ACSS conductor -The Insulators and associated conductor hardware will be replaced -The existing structures are assumed to have adequate strength to support the new conductors -The estimate is a rough order of magnitude estimate as no engineering was performed and SECo did not have access to record drawings.
28	Cricket Valley to Long Mountain line upgrade: Network Upgrade (NUF) costs to mitigate NY to NE interface transfer limit degradation were based on possible solutions identified during the June 2018 SIS process
29	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.



NY Power Authority and North American Transmission (T030)			
Description		Total Amount (In thousand \$)	
Direct Cost	1	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$34,378
	1.2	Foundations	\$18,131
	1.3	Structures	\$56,775
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$35,969
	1.5	Insulators, Fitting and Hardwares	\$11,553
	Subtotal (1)		<b>\$156,807</b>
	2	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$14,982
	2.2	East Greenbush Substation	\$61
	2.3	Schodack Substation	\$2,226
	2.4	Churchtown Substation	\$16,010
	2.5	Pleasant Valley Substation	\$2,778
	2.6	Substation Interconnections	\$6,312
Subtotal (2)		<b>\$42,369</b>	
Total (1+2)		\$199,176	
Contractors Mark-up (15% of Total 1+2)		\$29,876	
Total Direct Cost (A)		<b>\$229,052</b>	
Indirect Cost	3	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$1,992
	3.2	Project Management, Material Handling & Amenities	\$15,576
	3.3	Engineering	\$13,164
	3.4	Testing & Commissioning	\$972
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$14,389
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
Total Indirect Cost (3)		<b>\$53,721</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$282,773</b>	
4	<b>Network Upgrade Facilities (NUF)</b>		
	4.1	NUF proposed as element of the Project (Middletown Line and Terminal)	\$16,261
	4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000
Subtotal NUF Cost (C)		<b>\$46,261</b>	
Total Project Cost (B+C) 2017 \$		<b>\$329,034</b>	
Total Project Cost 2018 \$		<b>\$338,905</b>	

**NAT - NYPA - T030 - (Segment B Enhanced)**

Estimate Revision: 8

<i>NAT - NYPA - T030 - (Segment B Enhanced) - Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 57,825,407
Direct Labor, Material & Equipment Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 94,235,274
Direct Labor, Material & Equipment Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 4,746,361
Direct Labor, Material & Equipment Costs	D. Knickerbocker 345kV Substation - Install	\$ 14,982,000
Direct Labor, Material & Equipment Costs	E. Greenbush Substation - Removal	\$ 61,200
Direct Labor, Material & Equipment Costs	F. Schodack Substation - Install	\$ 2,089,357
Direct Labor, Material & Equipment Costs	G. Schodack Substation - Removal	\$ 136,200
Direct Labor, Material & Equipment Costs	H. Churchtown Substation - Install	\$ 15,046,621
Direct Labor, Material & Equipment Costs	I. Churchtown Substation - Removal	\$ 963,678
Direct Labor, Material & Equipment Costs	J. Pleasant Valley Substation - Install	\$ 2,777,841
Direct Labor, Material & Equipment Costs	K. Interconnection Milan Station	\$ 623,428
Direct Labor, Material & Equipment Costs	L. Interconnection Knickerbocker Station	\$ 1,262,237
Direct Labor, Material & Equipment Costs	M. Interconnection Churchtown Station	\$ 2,142,195
Direct Labor, Material & Equipment Costs	N. Interconnection Pleasant Valley Station	\$ 2,284,222
Direct Labor, Material & Equipment Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 21,428,571
Direct Labor, Material & Equipment Costs	P. NUF proposed as element of the Project (Middletown Line and Terminal)	\$ 11,615,000
<b>SUBTOTAL:</b>		<b>\$ 232,219,592</b>
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		<b>\$ 34,832,939</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>		<b>\$ -</b>
<b>TOTAL DIRECT:</b>		<b>\$ 267,052,530</b>

<i>NAT - NYPA - T030 - (Segment B Enhanced) - Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 13,461,432
Indirect Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 21,467,279
Indirect Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 984,454
Indirect Costs	D. Knickerbocker 345kV Substation - Install	\$ 3,909,529
Indirect Costs	E. Greenbush Substation - Removal	\$ 10,478
Indirect Costs	F. Schodack Substation - Install	\$ 508,425
Indirect Costs	G. Schodack Substation - Removal	\$ 23,318
Indirect Costs	H. Churchtown Substation - Install	\$ 3,712,994
Indirect Costs	I. Churchtown Substation - Removal	\$ 164,983
Indirect Costs	J. Pleasant Valley Substation - Install	\$ 712,299
Indirect Costs	K. Interconnection Milan Station	\$ 119,179
Indirect Costs	L. Interconnection Knickerbocker Station	\$ 225,130
Indirect Costs	M. Interconnection Churchtown Station	\$ 397,868
Indirect Costs	N. Interconnection Pleasant Valley Station	\$ 395,636
Indirect Costs	O. NUF to mitigate NY to NE interface transfer limit degradation	\$ 5,357,143
Indirect Costs	P. NUF proposed as element of the Project (Middletown Line and Terminal)	\$ 2,904,000
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lic. & Permit., and Envir. Mitigation)	\$ 7,627,609
<b>TOTAL INDIRECT:</b>		<b>\$ 61,981,753</b>

**TOTAL ESTIMATED COST: \$ 329,034,284**

**NAT - NYPA - T030 - (Segment B Enhanced)**

**A. Transmission Line Knickerbocker to Churchtown**

Estimate Revision: **8** Total: \$ **71,286,839**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>A. Transmission Line Knickerbocker to Churchtown</b>			
1. CLEARING & ACCESS	\$ 11,500	\$ 13,264,953	\$ 13,276,453
2. FOUNDATIONS	\$ 1,216,320	\$ 5,964,195	\$ 7,180,515
3. STRUCTURES	\$ 8,858,578	\$ 10,543,966	\$ 19,402,544
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,905,216	\$ 10,613,935	\$ 13,519,151
5. INSULATORS, FITTINGS, HARDWARE	\$ 2,937,361	\$ 1,509,383	\$ 4,446,745
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,274,318	\$ 12,187,114	\$ 13,461,432
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 17,203,293	\$ 54,083,546	\$ 71,286,839
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 17,203,293	\$ 54,083,546	\$ 71,286,839

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Knickerbocker to Churchtown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	19	Acre		\$ -	\$ 15,000	\$ 285,000	\$ 15,000	\$ 285,000
1.2	Clearing the ROW - Light (mowing)	63	Acre		\$ -	\$ 5,000	\$ 315,000	\$ 5,000	\$ 315,000
1.3	Permanent Access Road	23,126	LF		\$ -	\$ 45.00	\$ 1,040,688	\$ 45	\$ 1,040,688
1.4	Silt Fence	115,632	LF		\$ -	\$ 4.00	\$ 462,528	\$ 4	\$ 462,528
1.5	Matting - Access and ROW	92,506	LF		\$ -	\$ 70.00	\$ 6,475,392	\$ 70	\$ 6,475,392
1.6	Matting - To Work Area	12,075	LF		\$ -	\$ 70.00	\$ 845,250	\$ 70	\$ 845,250
1.7	Snow Removal	21.9	Mile		\$ -	\$ 16,000	\$ 350,400	\$ 16,000	\$ 350,400
1.8	ROW Restoration	21.9	Mile		\$ -	\$ 10,000	\$ 219,000	\$ 10,000	\$ 219,000
1.9	Work Pads	805,000	SF		\$ -	\$ 3.52	\$ 2,833,600	\$ 4	\$ 2,833,600
1.10	Restoration for Work Pad areas	161,000	SF		\$ -	\$ 0.15	\$ 24,150	\$ 0	\$ 24,150
1.11	Temporary Access Bridge	9	EA		\$ -	\$ 20,035	\$ 180,315	\$ 20,035	\$ 180,315
1.12	Air Bridge	-	EA		\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	4	EA		\$ -	\$ 4,580	\$ 18,320	\$ 4,580	\$ 18,320
1.14	Maintenance and Protection of Traffic on Public Roads	47	EA		\$ -	\$ 4,130	\$ 194,110	\$ 4,130	\$ 194,110
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	2	EA	\$ 2,000	\$ 4,000	\$ 2,500	\$ 5,000	\$ 4,500	\$ 9,000
1.17	Concrete Washout Station	2	EA		\$ -	\$ 1,850	\$ 3,700	\$ 1,850	\$ 3,700
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 11,500		\$ 13,264,953		\$ 13,276,453
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	EA	\$ 3,575	\$ 3,575	\$ 24,310	\$ 24,310	\$ 27,885	\$ 27,885
2.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	EA	\$ 2,888	\$ 2,888	\$ 19,635	\$ 19,635	\$ 22,523	\$ 22,523
2.3	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	7	EA	\$ 3,713	\$ 25,988	\$ 25,245	\$ 176,715	\$ 28,958	\$ 202,703
2.4	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	129	EA	\$ 2,750	\$ 354,750	\$ 18,700	\$ 2,412,300	\$ 21,450	\$ 2,767,050
2.5	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	3	EA	\$ 2,888	\$ 8,663	\$ 19,635	\$ 58,905	\$ 22,523	\$ 67,568
2.6	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	10	EA	\$ 3,163	\$ 31,625	\$ 21,505	\$ 215,050	\$ 24,668	\$ 246,675
2.7	1-CKT 345KV VERTICAL LARGE ANGLE DEADEND (60°-90°)	1	EA	\$ 118,325	\$ 118,325	\$ 119,592	\$ 119,592	\$ 237,917	\$ 237,917
2.8	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	EA	\$ 92,030	\$ 92,030	\$ 93,016	\$ 93,016	\$ 185,046	\$ 185,046
2.9	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	8	EA	\$ 72,310	\$ 578,477	\$ 73,084	\$ 584,672	\$ 145,394	\$ 1,163,149
2.10									
2.11									
2.12									
2.13	Rock Excavation Adder	1,130.0	CY	\$ -	\$ -	\$ 2,000	\$ 2,260,000	\$ 2,000	\$ 2,260,000
2.14									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.15									
2.16									
2.17									
2.18									
<b>TOTAL - FOUNDATIONS:</b>					\$ 1,216,320		\$ 5,964,195		\$ 7,180,515
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	Structure	\$ 115,897	\$ 115,897	\$ 69,538	\$ 69,538	\$ 185,435	\$ 185,435
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	Structure	\$ 56,203	\$ 56,203	\$ 33,722	\$ 33,722	\$ 89,925	\$ 89,925
3.3	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	7	Structure	\$ 82,929	\$ 580,502	\$ 49,757	\$ 348,301	\$ 132,686	\$ 928,804
3.4	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	129	Structure	\$ 43,936	\$ 5,667,734	\$ 26,362	\$ 3,400,640	\$ 70,297	\$ 9,068,374
3.5	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	3	Structure	\$ 60,948	\$ 182,845	\$ 36,569	\$ 109,707	\$ 97,517	\$ 292,552
3.6	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	10	Structure	\$ 64,662	\$ 646,619	\$ 38,797	\$ 387,972	\$ 103,459	\$ 1,034,591
3.7	1-CKT 345KV VERTICAL LARGE ANGLE DEADEND (60°-90°)	1	Structure	\$ 269,373	\$ 269,373	\$ 161,624	\$ 161,624	\$ 430,997	\$ 430,997
3.8	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	Structure	\$ 130,695	\$ 130,695	\$ 78,417	\$ 78,417	\$ 209,112	\$ 209,112
3.9	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	8	Structure	\$ 140,905	\$ 1,127,244	\$ 84,543	\$ 676,346	\$ 225,449	\$ 1,803,590
3.10									
3.11									
3.12	Remove Existing Foundation	688	EA	\$ -	\$ -	\$ 3,250	\$ 2,236,000	\$ 3,250	\$ 2,236,000
3.13	Remove Existing Structure and Accessories	172	EA	\$ -	\$ -	\$ 12,500	\$ 2,150,000	\$ 12,500	\$ 2,150,000
3.14	Install Grounding and Grounding Accessories	161	Pole	\$ 506	\$ 81,466	\$ 5,539	\$ 891,699	\$ 6,045	\$ 973,165
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 8,858,578		\$ 10,543,966		\$ 19,402,544
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345KV - (1) 477kcmil 26/7 ACSS "Hawk"	1,112,681	LF	\$ 1.75	\$ 1,947,192	\$ 5.00	\$ 5,563,405	\$ 6.75	\$ 7,510,597
4.2	(1) OPGW 36 Fiber AC-33/38/571	123,631	LF	\$ 1.35	\$ 166,902	\$ 5.00	\$ 618,155	\$ 6.35	\$ 785,057
4.3	(1) 3/8" EHS7 Steel	121,414	LF	\$ 0.47	\$ 57,065	\$ 5.00	\$ 607,070	\$ 5.47	\$ 664,135
4.4	Remove Existing 115kV Cable From Existing Structures	43.8	Mile	\$ -	\$ -	\$ 30,000	\$ 1,314,000	\$ 30,000.00	\$ 1,314,000
4.5	Remove Existing OPGW Cable and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.6	Remove Existing OHSW and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.7	115KV - (1) 954kcmil 54/7 ACSS "Cardinal"	364,241	LF	\$ 1.90	\$ 692,058	\$ 5.00	\$ 1,821,205	\$ 6.90	\$ 2,513,263
4.8	Rider Poles (47 Locations)	24	Set	\$ 1,750	\$ 42,000	\$ 3,500	\$ 84,000	\$ 5,250.00	\$ 126,000
4.9	Rider Poles - Relocated	23	Set	\$ -	\$ -	\$ 3,500	\$ 80,500	\$ 3,500.00	\$ 80,500
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,905,216		\$ 10,613,935		\$ 13,519,151
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	705	Assembly	\$ 1,800	\$ 1,269,000	\$ 720	\$ 507,600	\$ 2,520	\$ 1,776,600
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	695	Assembly	\$ 900	\$ 625,500	\$ 560	\$ 389,200	\$ 1,460	\$ 1,014,700
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	300	Assembly	\$ 1,800	\$ 540,000	\$ 720	\$ 216,000	\$ 2,520	\$ 756,000
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	126	Assembly	\$ 900	\$ 113,400	\$ 560	\$ 70,560	\$ 1,460	\$ 183,960
5.5			Assembly	\$ 900	\$ -	\$ 360	\$ -	\$ 1,260	\$ -
5.6	OPGW Assembly - Tangent	141	Assembly	\$ 200	\$ 28,200	\$ 150	\$ 21,150	\$ 350	\$ 49,350
5.7	OPGW Assembly - Angle / DE	40	Assembly	\$ 250	\$ 10,000	\$ 150	\$ 6,000	\$ 400	\$ 16,000
5.8	OHSW Assembly - Tangent	139	Assembly	\$ 200	\$ 27,800	\$ 150	\$ 20,850	\$ 350	\$ 48,650
5.9	OHSW Assembly - Angle / DE	36	Assembly	\$ 250	\$ 9,000	\$ 150	\$ 5,400	\$ 400	\$ 14,400
5.10	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.11	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
5.12	Spacer - Conductor	3,651	EA	\$ 50	\$ 182,550	\$ 35	\$ 127,785	\$ 85	\$ 310,335
5.13	Vibration Dampers - Conductor	1,971	EA	\$ 35	\$ 68,985	\$ 35	\$ 68,985	\$ 70	\$ 137,970
5.14	Shield wire / OPGW Dampers, Misc. Fittings	442	EA	\$ 27	\$ 11,934	\$ 35	\$ 15,470	\$ 62	\$ 27,404
5.15									
5.16	Replace - Mono Pole Vertical Tangent - V-String	-	Set	\$ 1,800	\$ -	\$ 1,080	\$ -	\$ 2,880	\$ -
5.17	Replace - Dead-end & Angle Insulators	-	Set	\$ 2,540	\$ -	\$ 2,025	\$ -	\$ 4,565	\$ -
5.18									
5.19	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.20	Misc. materials (Signs and Markers)	21.9	Mile	\$ 770	\$ 16,863	\$ 1,006	\$ 22,031	\$ 1,776	\$ 38,894
5.21		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.22									
5.23									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 2,937,361		\$ 1,509,383		\$ 4,446,745
<b>A. Transmission Line Knickerbocker to Churchtown</b>					\$ 15,928,975		\$ 41,896,432		\$ 57,825,407
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 578,254	\$ 578,254	\$ 578,254	\$ 578,254
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,365,525	\$ 3,365,525	\$ 3,365,525	\$ 3,365,525
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 578,254	\$ 578,254	\$ 578,254	\$ 578,254
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 578,254	\$ 578,254	\$ 578,254	\$ 578,254
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 2,891,270	\$ 2,891,270	\$ 2,891,270	\$ 2,891,270
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 173,476	\$ 173,476	\$ 173,476	\$ 173,476
6.7	Geotech	22	Location	\$ -	\$ -	\$ 3,500	\$ 77,000	\$ 3,500	\$ 77,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 404,778	\$ 404,778	\$ 404,778	\$ 404,778
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 173,476	\$ 173,476	\$ 173,476	\$ 173,476
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 3,269,000	\$ 3,269,000	\$ 3,269,000	\$ 3,269,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,274,318	\$ 1,274,318	\$ -	\$ -	\$ 1,274,318	\$ 1,274,318
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 57,825	\$ 57,825	\$ 57,825	\$ 57,825
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,274,318		\$ 12,187,114		\$ 13,461,432

**NAT - NYPA - T030 - (Segment B Enhanced)**

**B. Transmission Line Churchtown to Pleasant Valley**

Estimate Revision: **8**

Total: \$ 115,702,553

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>B. Transmission Line Churchtown to Pleasant Valley</b>			
1. CLEARING & ACCESS	\$ 14,000	\$ 19,683,466	\$ 19,697,466
2. FOUNDATIONS	\$ 830,338	\$ 8,957,307	\$ 9,787,645
3. STRUCTURES	\$ 13,291,751	\$ 22,537,866	\$ 35,829,617
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 4,293,840	\$ 17,684,415	\$ 21,978,255
5. INSULATORS, FITTINGS, HARDWARE	\$ 4,595,434	\$ 2,346,857	\$ 6,942,291
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 1,842,029	\$ 19,625,250	\$ 21,467,279
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 24,867,392</b>	<b>\$ 90,835,161</b>	<b>\$ 115,702,553</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 24,867,392</b>	<b>\$ 90,835,161</b>	<b>\$ 115,702,553</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Churchtown to Pleasant Valley</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	15.0	Acre	\$ -	\$ -	\$ 15,000	\$ 225,000	\$ 15,000	\$ 225,000
1.2	Clearing the ROW - Light (mowing)	102.0	Acre	\$ -	\$ -	\$ 5,000	\$ 510,000	\$ 5,000	\$ 510,000
1.3	Permanent Access Road	34,109	LF	\$ -	\$ -	\$ 45	\$ 1,534,896	\$ 45	\$ 1,534,896
1.4	Silt Fence	170,544.0	LF	\$ -	\$ -	\$ 4	\$ 682,176	\$ 4	\$ 682,176
1.5	Matting - Access and ROW	136,435	LF	\$ -	\$ -	\$ 70	\$ 9,550,464	\$ 70	\$ 9,550,464
1.6	Matting - To Work Area	18,300.0	LF	\$ -	\$ -	\$ 70	\$ 1,281,000	\$ 70	\$ 1,281,000
1.7	Snow Removal	32.3	Mile	\$ -	\$ -	\$ 16,000	\$ 516,800	\$ 16,000	\$ 516,800
1.8	ROW Restoration	32.3	Mile	\$ -	\$ -	\$ 10,000	\$ 323,000	\$ 10,000	\$ 323,000
1.9	Work Pads	1,220,000.0	SF	\$ -	\$ -	\$ 4	\$ 4,294,400	\$ 4	\$ 4,294,400
1.10	Restoration for Work Pad areas	244,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 36,600	\$ 0	\$ 36,600
1.11	Temporary Access Bridge	14	EA	\$ -	\$ -	\$ 20,035	\$ 280,490	\$ 20,035	\$ 280,490
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	12	EA	\$ -	\$ -	\$ 4,580	\$ 54,960	\$ 4,580	\$ 54,960
1.14	Maintenance and Protection of Traffic on Public Roads	86	EA	\$ -	\$ -	\$ 4,130	\$ 355,180	\$ 4,130	\$ 355,180
1.15	Gates	4	EA	\$ 2,000	\$ 8,000	\$ 2,500	\$ 10,000	\$ 4,500	\$ 18,000
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 14,000		\$ 19,683,466		\$ 19,697,466
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	EA	\$ 3,575	\$ 3,575	\$ 24,310	\$ 24,310	\$ 27,885	\$ 27,885
2.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	EA	\$ 2,063	\$ 2,063	\$ 14,025	\$ 14,025	\$ 16,088	\$ 16,088
2.3	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	14	EA	\$ 3,163	\$ 44,275	\$ 21,505	\$ 301,070	\$ 24,668	\$ 345,345
2.4	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	187	EA	\$ 1,925	\$ 359,975	\$ 13,090	\$ 2,447,830	\$ 15,015	\$ 2,807,805
2.5	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	4	EA	\$ 2,063	\$ 8,250	\$ 14,025	\$ 56,100	\$ 16,088	\$ 64,350
2.6	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	29	EA	\$ 2,200	\$ 63,800	\$ 14,960	\$ 433,840	\$ 17,160	\$ 497,640
2.7	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	EA	\$ 32,046	\$ 32,046	\$ 32,390	\$ 32,390	\$ 64,436	\$ 64,436
2.8	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	7	EA	\$ 45,194	\$ 316,355	\$ 45,678	\$ 319,743	\$ 90,871	\$ 636,097

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.9	Rock Excavation Adder	2,664.0	CY	\$ -	\$ -	\$ 2,000	\$ 5,328,000	\$ 2,000	\$ 5,328,000
2.10									
2.11									
2.12									
<b>TOTAL - FOUNDATIONS:</b>					\$ 830,338		\$ 8,957,307		\$ 9,787,645
<b>3. STRUCTURES</b>									
3.1	1-CKT 345KV VERTICAL SMALL ANGLE (1°-15°)	1	Structure	\$ 115,897	\$ 115,897	\$ 69,538	\$ 69,538	\$ 185,435	\$ 185,435
3.2	1-CKT 345KV VERTICAL TANGENT (0°-1°)	1	Structure	\$ 82,122	\$ 82,122	\$ 49,273	\$ 49,273	\$ 131,394	\$ 131,394
3.3	2-CKT 115KV/345KV DELTA SMALL ANGLE (1°-15°)	14	Structure	\$ 88,655	\$ 1,241,174	\$ 53,193	\$ 744,705	\$ 141,848	\$ 1,985,879
3.4	2-CKT 115KV/345KV DELTA TANGENT (0°-1°)	187	Structure	\$ 44,674	\$ 8,354,097	\$ 26,805	\$ 5,012,458	\$ 71,479	\$ 13,366,555
3.5	2-CKT 115KV/345KV DELTA TANGENT (0°-1°) HD	4	Structure	\$ 57,554	\$ 230,214	\$ 34,532	\$ 138,128	\$ 92,086	\$ 368,342
3.6	2-CKT 115KV/345KV DELTA TANGENT DEADEND (0°-5°)	29	Structure	\$ 67,219	\$ 1,949,354	\$ 40,331	\$ 1,169,613	\$ 107,551	\$ 3,118,967
3.7	1-CKT 345KV VERTICAL MEDIUM ANGLE DEADEND (15°-60°)	1	Structure	\$ 143,312	\$ 143,312	\$ 85,987	\$ 85,987	\$ 229,299	\$ 229,299
3.8	2-CKT 115KV/345KV DELTA MEDIUM ANGLE DEADEND (15°-60°)	7	Structure	\$ 150,302	\$ 1,052,117	\$ 90,181	\$ 631,270	\$ 240,484	\$ 1,683,388
3.9	Remove Existing Foundation	2,084	EA	\$ -	\$ -	\$ 3,250	\$ 6,773,000	\$ 3,250	\$ 6,773,000
3.10	Remove Existing Structure and Accessories	521	EA	\$ -	\$ -	\$ 12,500	\$ 6,512,500	\$ 12,500	\$ 6,512,500
3.11									
3.12	Install Grounding and Grounding Accessories	244	Pole	\$ 506	\$ 123,464	\$ 5,539	\$ 1,351,394	\$ 6,045	\$ 1,474,858
3.13									
3.14									
3.15									
3.16									
3.17									
<b>TOTAL - STRUCTURES PRINCTOWN TO NEW SCOTLAND:</b>					\$ 13,291,751		\$ 22,537,866		\$ 35,829,617
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 477kcmil 26/7 ACSS "Hawk"	1,631,599	LF	\$ 1.75	\$ 2,855,298	\$ 5.00	\$ 8,157,995	\$ 6.75	\$ 11,013,293
4.2	(1) OPGW 36 Fiber AC-33/38/571	181,289	LF	\$ 1.35	\$ 244,740	\$ 5.00	\$ 906,445	\$ 6.35	\$ 1,151,185
4.3	(1) 3/8" EHS7 Steel	181,289	LF	\$ 0.47	\$ 85,206	\$ 5.00	\$ 906,445	\$ 5.47	\$ 991,651
4.5	Remove Existing 115kv Cable From Existing Structures	130.4	Mile	\$ -	\$ -	\$ 30,000	\$ 3,912,000	\$ 30,000.00	\$ 3,912,000
4.6	Remove Existing OPGW Cable and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.7	Remove Existing OHSW and Accessories	32.6	Mile	\$ -	\$ -	\$ 12,000	\$ 390,600	\$ 12,000.00	\$ 390,600
4.8	115kv - (1) 954kcmil 54/7 ACSS "Cardinal"	543,866	LF	\$ 1.90	\$ 1,033,345	\$ 5.00	\$ 2,719,330	\$ 6.90	\$ 3,752,675
4.9									
4.10	Rider Poles - Relocated	43	Set	\$ -	\$ -	\$ 3,500	\$ 150,500	\$ 3,500.00	\$ 150,500
4.11	Rider Poles (86 Total)	43	EA	\$ 1,750	\$ 75,250	\$ 3,500	\$ 150,500	\$ 5,250.00	\$ 225,750
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 4,293,840		\$ 17,684,415		\$ 21,978,255
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	1,035	Assembly	\$ 1,800	\$ 1,863,000	\$ 720	\$ 745,200	\$ 2,520	\$ 2,608,200
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	1,025	Assembly	\$ 900	\$ 922,500	\$ 560	\$ 574,000	\$ 1,460	\$ 1,496,500
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	555	Assembly	\$ 1,800	\$ 999,000	\$ 720	\$ 399,600	\$ 2,520	\$ 1,398,600
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	252	Assembly	\$ 900	\$ 226,800	\$ 560	\$ 141,120	\$ 1,460	\$ 367,920
5.5			Assembly	\$ -	\$ -	\$ 360	\$ -	\$ 360	\$ -
5.6	OPGW Assembly - Tangent	207	Assembly	\$ 200	\$ 41,400	\$ 150	\$ 31,050	\$ 350	\$ 72,450
5.7	OPGW Assembly - Angle / DE	74	Assembly	\$ 250	\$ 18,500	\$ 150	\$ 11,100	\$ 400	\$ 29,600
5.8	OHSW Assembly - Tangent	205	Assembly	\$ 200	\$ 41,000	\$ 150	\$ 30,750	\$ 350	\$ 71,750
5.9	OHSW Assembly - Angle / DE	72	Assembly	\$ 250	\$ 18,000	\$ 150	\$ 10,800	\$ 400	\$ 28,800
5.10	OPGW Splice Boxes	12	Set	\$ 1,746	\$ 20,954	\$ 2,274	\$ 27,288	\$ 4,020	\$ 48,242
5.11	OPGW Splice & Test	12	EA	\$ 2,520	\$ 30,240	\$ 2,520	\$ 30,240	\$ 5,040	\$ 60,480
5.12	Spacer - Conductor	5,414	EA	\$ 50	\$ 270,700	\$ 35	\$ 189,490	\$ 85	\$ 460,190
5.13	Vibration Dampers - Conductor	2,878	EA	\$ 35	\$ 100,730	\$ 35	\$ 100,730	\$ 70	\$ 201,460
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	657	EA	\$ 27	\$ 17,739	\$ 35	\$ 22,995	\$ 62	\$ 40,734

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	32.3	Mile	\$ 770	\$ 24,871	\$ 1,006	\$ 32,494	\$ 1,776	\$ 57,365
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 4,595,434		\$ 2,346,857		\$ 6,942,291
<b>B. Transmission Line Churchtown to Pleasant Valley</b>					\$ 23,025,363		\$ 71,209,911		\$ 94,235,274
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 942,353	\$ 942,353	\$ 942,353	\$ 942,353
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 5,484,634	\$ 5,484,634	\$ 5,484,634	\$ 5,484,634
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 942,353	\$ 942,353	\$ 942,353	\$ 942,353
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 942,353	\$ 942,353	\$ 942,353	\$ 942,353
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 4,711,764	\$ 4,711,764	\$ 4,711,764	\$ 4,711,764
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 282,706	\$ 282,706	\$ 282,706	\$ 282,706
6.7	Geotech	33	Location	\$ -	\$ -	\$ 3,500	\$ 115,500	\$ 3,500	\$ 115,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 659,647	\$ 659,647	\$ 659,647	\$ 659,647
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 282,706	\$ 282,706	\$ 282,706	\$ 282,706
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 5,127,000	\$ 5,127,000	\$ 5,127,000	\$ 5,127,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 1,842,029	\$ 1,842,029	\$ -	\$ -	\$ 1,842,029	\$ 1,842,029
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 94,235	\$ 94,235	\$ 94,235	\$ 94,235
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 1,842,029		\$ 19,625,250		\$ 21,467,279

**NAT - NYPA - T030 - (Segment B Enhanced)**

**C. Blue Stores Junction to Blue Stores Substation**

Estimate Revision: **8**

Total: \$ **5,730,815**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>C. Blue Stores Junction to Blue Stores Substation</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,404,512	\$ 1,404,512
2. FOUNDATIONS	\$ 236,848	\$ 925,954	\$ 1,162,802
3. STRUCTURES	\$ 596,484	\$ 946,665	\$ 1,543,149
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 84,763	\$ 387,095	\$ 471,858
5. INSULATORS, FITTINGS, HARDWARE	\$ 107,544	\$ 56,496	\$ 164,040
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 82,051	\$ 902,403	\$ 984,454
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,107,690</b>	<b>\$ 4,623,125</b>	<b>\$ 5,730,815</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,107,690</b>	<b>\$ 4,623,125</b>	<b>\$ 5,730,815</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	4.0	Acre	\$ -	\$ -	\$ 5,000	\$ 20,000	\$ 5,000	\$ 20,000
1.3	Permanent Access Road	2,218	LF	\$ -	\$ -	\$ 45	\$ 99,792	\$ 45	\$ 99,792
1.4	Silt Fence	11,088.0	LF	\$ -	\$ -	\$ 4	\$ 44,352	\$ 4	\$ 44,352
1.5	Matting - Access and ROW	8,870	LF	\$ -	\$ -	\$ 70	\$ 620,928	\$ 70	\$ 620,928
1.6	Matting - To Work Area	1,800.0	LF	\$ -	\$ -	\$ 70	\$ 126,000	\$ 70	\$ 126,000
1.7	Snow Removal	2.1	Mile	\$ -	\$ -	\$ 16,000	\$ 33,600	\$ 16,000	\$ 33,600
1.8	ROW Restoration	2.1	Mile	\$ -	\$ -	\$ 10,000	\$ 21,000	\$ 10,000	\$ 21,000
1.9	Work Pads	120,000.0	SF	\$ -	\$ -	\$ 4	\$ 422,400	\$ 4	\$ 422,400
1.10	Restoration for Work Pad areas	24,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 3,600	\$ 0	\$ 3,600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	1	EA	\$ -	\$ -	\$ 4,580	\$ 4,580	\$ 4,580	\$ 4,580
1.14	Maintenance and Protection of Traffic on Public Roads	2	EA	\$ -	\$ -	\$ 4,130	\$ 8,260	\$ 4,130	\$ 8,260
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	-	EA	\$ -	\$ -	\$ 1,850	\$ -	\$ 1,850	\$ -
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ -		\$ 1,404,512		\$ 1,404,512
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	6	EA	\$ 31,225	\$ 187,348	\$ 31,559	\$ 189,354	\$ 62,784	\$ 376,702
2.2	Direct Embed - 115kV Single Circuit H- Pole Tangent	18	EA	\$ 2,750	\$ 49,500	\$ 18,700	\$ 336,600	\$ 21,450	\$ 386,100
2.3	Rock Excavation Adder	200	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - FOUNDATIONS:</b>					\$ 236,848		\$ 925,954		\$ 1,162,802
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit H- Pole Angle/ DE	6	Structure	\$ 39,822	\$ 238,929	\$ 23,893	\$ 143,358	\$ 63,714	\$ 382,287
3.2	115kV Single Circuit H- Pole Tangent	18	Structure	\$ 18,515	\$ 333,266	\$ 11,109	\$ 199,960	\$ 29,624	\$ 533,226
3.3	Remove Existing Foundation	-	EA	\$ -	\$ -	\$ 7,500	\$ -	\$ 7,500	\$ -
3.4	Remove Existing Structure and Accessories	27	EA	\$ -	\$ -	\$ 12,500	\$ 337,500	\$ 12,500	\$ 337,500
3.5									
3.6	Install Grounding and Grounding Accessories	48	Pole	\$ 506	\$ 24,288	\$ 5,539	\$ 265,848	\$ 6,045	\$ 290,136
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 596,484		\$ 946,665		\$ 1,543,149
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.4	115kV - (1) 795kcmil 26/7 ACSR "Drake"	34,927.0	LF	\$ 1.72	\$ 60,074	\$ 5.00	\$ 174,635	\$ 6.72	\$ 234,709
4.5	(1) OPGW 36 Fiber AC-33/38/571	11,642.0	LF	\$ 1.35	\$ 15,717	\$ 5.00	\$ 58,210	\$ 6.35	\$ 73,927
4.6	(1) 3/8" EHS7 Steel	11,642.0	LF	\$ 0.47	\$ 5,472	\$ 5.00	\$ 58,210	\$ 5.47	\$ 63,682
4.7	Remove Existing Cable	2.1	Mile	\$ -	\$ -	\$ 30,000	\$ 63,600	\$ 30,000.00	\$ 63,600
4.8	Remove Existing OPGW Cable and Accessories	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.9	Remove Existing OHSW and Accessories	2.1	Mile	\$ -	\$ -	\$ 12,000	\$ 25,440	\$ 12,000.00	\$ 25,440
4.10		-							
4.11		-							
4.12	Rider Poles (Locations)	2.0	EA	\$ 1,750	\$ 3,500	\$ 3,500	\$ 7,000	\$ 5,250.00	\$ 10,500
4.13									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 84,763		\$ 387,095		\$ 471,858
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	54	Assembly	\$ 900	\$ 48,600	\$ 360	\$ 19,440	\$ 1,260	\$ 68,040
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	36	Assembly	\$ 900	\$ 32,400	\$ 360	\$ 12,960	\$ 1,260	\$ 45,360
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.7	OPGW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.8	OHSW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.9	OHSW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.10	OPGW Splice Boxes	2	Set	\$ 1,746	\$ 3,492	\$ 2,274	\$ 4,548	\$ 4,020	\$ 8,040
5.11	OPGW Splice & Test	2	EA	\$ 2,520	\$ 5,040	\$ 2,520	\$ 5,040	\$ 5,040	\$ 10,080
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	72	EA	\$ 35	\$ 2,520	\$ 35	\$ 2,520	\$ 70	\$ 5,040
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	25	EA	\$ 27	\$ 675	\$ 35	\$ 875	\$ 62	\$ 1,550
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	2.1	Mile	\$ 770	\$ 1,617	\$ 1,006	\$ 2,113	\$ 1,776	\$ 3,730
5.17									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 107,544		\$ 56,496		\$ 164,040
<b>C. Blue Stores Junction to Blue Stores Substation</b>					\$ 1,025,639		\$ 3,720,722		\$ 4,746,361
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 276,245	\$ 276,245	\$ 276,245	\$ 276,245
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 237,318	\$ 237,318	\$ 237,318	\$ 237,318
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.7	Geotech	2	Location	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 33,225	\$ 33,225	\$ 33,225	\$ 33,225
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 153,000	\$ 153,000	\$ 153,000	\$ 153,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 82,051	\$ 82,051	\$ -	\$ -	\$ 82,051	\$ 82,051
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 4,746	\$ 4,746	\$ 4,746	\$ 4,746
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 82,051		\$ 902,403		\$ 984,454

**NAT - NYPA - T030 - (Segment B Enhanced)**

**D. Knickerbocker 345kV Substation - Install**

Estimate Revision: **8** Total: \$ **18,891,529**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>D. Knickerbocker 345kV Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 277,200	\$ 1,745,500	\$ 2,022,700
2. SUBSTATION FOUNDATIONS	\$ 1,467,421	\$ 1,581,150	\$ 3,048,571
3. SUBSTATION STRUCTURES	\$ 710,400	\$ 710,400	\$ 1,420,800
4. MAJOR EQUIPMENT	\$ 600,000	\$ 240,000	\$ 840,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,191,500	\$ 542,000	\$ 1,733,500
6. CONTROL HOUSE / PANELS	\$ 1,678,925	\$ 1,232,275	\$ 2,911,200
7. MISC ITEMS	\$ 1,114,327	\$ 1,890,902	\$ 3,005,229
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 563,182	\$ 3,346,347	\$ 3,909,529
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 7,602,955</b>	<b>\$ 11,288,574</b>	<b>\$ 18,891,529</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 7,602,955</b>	<b>\$ 11,288,574</b>	<b>\$ 18,891,529</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Knickerbocker 345kV Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	4.75	ACRES	\$ -	\$ -	\$ 230,000	\$ 1,092,500	\$ 230,000	\$ 1,092,500
1.2	Station stone within substation fence.	2,100	CY	\$ 27	\$ 56,700	\$ 75	\$ 157,500	\$ 102	\$ 214,200
1.3	Substation Fence	1,820	LF	\$ 100	\$ 182,000	\$ 100	\$ 182,000	\$ 200	\$ 364,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide	1,100	LF	\$ 35	\$ 38,500	\$ 285	\$ 313,500	\$ 320	\$ 352,000
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 277,200		\$ 1,745,500		\$ 2,022,700
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 26,145	\$ 104,580	\$ 28,000	\$ 112,000	\$ 54,145	\$ 216,580
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	6	EA	\$ 26,145	\$ 156,870	\$ 28,000	\$ 168,000	\$ 54,145	\$ 324,870
2.1e	Switch Stand Foundations	96	EA	\$ 4,482	\$ 430,272	\$ 4,800	\$ 460,800	\$ 9,282	\$ 891,072
2.1f	Station Service Transformer Stand Foundation	4	EA	\$ 4,482	\$ 17,928	\$ 4,800	\$ 19,200	\$ 9,282	\$ 37,128
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	63	EA	\$ 4,482	\$ 282,366	\$ 4,800	\$ 302,400	\$ 9,282	\$ 584,766
2.1j	Instrument Transformer Stand Foundations	27	EA	\$ 4,482	\$ 121,014	\$ 4,800	\$ 129,600	\$ 9,282	\$ 250,614
2.1k	Arrester Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1m	Wave Trap Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1p	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -
2.1q									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 33,615	\$ 33,615	\$ 36,000	\$ 36,000	\$ 69,615	\$ 69,615
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribuion Line - 3ph.	1	LS	\$ -	\$ -	\$ 9,750	\$ 9,750	\$ 9,750	\$ 9,750
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	4	EA	\$ 5,229	\$ 20,916	\$ 5,600	\$ 22,400	\$ 10,829	\$ 43,316
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,467,421		\$ 1,581,150		\$ 3,048,571
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1a	Substation A-Frame Structures - Stand alone	1	EA	\$ 37,000	\$ 37,000	\$ 37,000	\$ 37,000	\$ 74,000	\$ 74,000
3.1b	Substation A-Frame Structures - Shared Column	2	EA	\$ 37,000	\$ 74,000	\$ 37,000	\$ 74,000	\$ 74,000	\$ 148,000
3.1c	Switch Stands	16	EA	\$ 14,800	\$ 236,800	\$ 14,800	\$ 236,800	\$ 29,600	\$ 473,600
3.1d	Station Service Transformer Stand	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	63	EA	\$ 3,700	\$ 233,100	\$ 3,700	\$ 233,100	\$ 7,400	\$ 466,200
3.1g	Instrument Transformer Stand	27	EA	\$ 1,850	\$ 49,950	\$ 1,850	\$ 49,950	\$ 3,700	\$ 99,900
3.1h	Arrester Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1j	Wave Trap Stand	3	EA	\$ 7,400	\$ 22,200	\$ 7,400	\$ 22,200	\$ 14,800	\$ 44,400
3.1k	Misc. Structures	4	EA	\$ 6,475	\$ 25,900	\$ 6,475	\$ 25,900	\$ 12,950	\$ 51,800
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 710,400		\$ 710,400		\$ 1,420,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks with Reactors	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA			\$ 750,000	\$ -	\$ 750,000	\$ -
4.1e									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 600,000		\$ 240,000		\$ 840,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	3	EA	\$ 40,000	\$ 120,000	\$ 15,000	\$ 45,000	\$ 55,000	\$ 165,000
5.1b	Disconnect Switches - 3ph w/ manual operator	9	EA	\$ 35,000	\$ 315,000	\$ 17,500	\$ 157,500	\$ 52,500	\$ 472,500
5.1c	VT'S	9	EA	\$ 25,000	\$ 225,000	\$ 12,000	\$ 108,000	\$ 37,000	\$ 333,000
5.1d	CT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1e	CCVT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,191,500		\$ 542,000		\$ 1,733,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 286,650	\$ 286,650	\$ 85,000	\$ 85,000	\$ 371,650	\$ 371,650
6.2	Protection and Telecom Equipment Panels	15	EA	\$ 35,000	\$ 525,000	\$ 10,000	\$ 150,000	\$ 45,000	\$ 675,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 352,275	\$ 352,275	\$ 352,275	\$ 352,275	\$ 704,550	\$ 704,550
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 1,678,925		\$ 1,232,275		\$ 2,911,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,200.0	LF	\$ 185.00	\$ 222,000	\$ 170.00	\$ 204,000	\$ 355	\$ 426,000
7.2	Rigid Bus, Fittings & Insulators	3,000.0	LF	\$ 125.07	\$ 375,210	\$ 237.10	\$ 711,300	\$ 362	\$ 1,086,510
7.3	Strain Bus, Connectors & Insulators	0.0	LF	\$ 39.30	\$ -	\$ 53.35	\$ -	\$ 93	\$ -
7.4	Grounding System	16,900.0	LF	\$ 6.93	\$ 117,117	\$ 32.58	\$ 550,602	\$ 40	\$ 667,719
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,114,327		\$ 1,890,902		\$ 3,005,229
<b>D. Knickerbocker 345kV Substation - Install</b>					\$ 7,039,773		\$ 7,942,227		\$ 14,982,000
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 149,820	\$ 149,820	\$ 149,820	\$ 149,820
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 871,975	\$ 871,975	\$ 871,975	\$ 871,975
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 149,820	\$ 149,820	\$ 149,820	\$ 149,820
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 149,820	\$ 149,820	\$ 149,820	\$ 149,820
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,198,560	\$ 1,198,560	\$ 1,198,560	\$ 1,198,560
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	2	EA	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 104,874	\$ 104,874	\$ 104,874	\$ 104,874
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 374,550	\$ 374,550	\$ 374,550	\$ 374,550
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 44,946	\$ 44,946	\$ 44,946	\$ 44,946

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 280,000	\$ 280,000	\$ 280,000	\$ 280,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 563,182	\$ 563,182	\$ -	\$ -	\$ 563,182	\$ 563,182
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 14,982	\$ 14,982	\$ 14,982	\$ 14,982
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 563,182		\$ 3,346,347		\$ 3,909,529

**NAT - NYPA - T030 - (Segment B Enhanced)**

**E. Greenbush Substation - Removal**

Estimate Revision: **8**

Total: \$ **71,678**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>E. Greenbush Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 12,000	\$ 12,000
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ 7,000	\$ 7,000
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 35,000	\$ 35,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 7,200	\$ 7,200
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 10,478	\$ 10,478
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 71,678	\$ 71,678
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 71,678	\$ 71,678

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
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**E. Greenbush Substation - Removal**

**1. SITE PREP/ GRADING/ FENCING / CIVIL**

1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									

**TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL**

**2. SUBSTATION FOUNDATIONS**

<b>2.1</b>	<b>345kV</b>								
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	1	EA	\$ -	\$ -	\$ 7,200	\$ 7,200	\$ 7,200	\$ 7,200
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	2	EA	\$ -	\$ -	\$ 2,400	\$ 4,800	\$ 2,400	\$ 4,800
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 12,000		\$ 12,000
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ -		\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	1	EA	\$ -	\$ -	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 7,000		\$ 7,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1 345kV</b>									
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2 230kV</b>									
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3 115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	2	EA	\$ -	\$ -	\$ 17,500	\$ 35,000	\$ 17,500	\$ 35,000
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 35,000		\$ 35,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	2	EA	\$ -	\$ -	\$ 3,600	\$ 7,200	\$ 3,600	\$ 7,200
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 7,200		\$ 7,200
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	EA	\$ -	\$ -	\$ 126.25	\$ -	\$ 126	\$ -
7.3	Strain Bus, Connectors & Insulators	0	LS	\$ -	\$ -	\$ 21,000.00	\$ -	\$ 21,000	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>E. Greenbush Substation - Removal</b>					\$ -		\$ 61,200		\$ 61,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,562	\$ 3,562	\$ 3,562	\$ 3,562
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 612	\$ 612	\$ 612	\$ 612
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 4,896	\$ 4,896	\$ 4,896	\$ 4,896
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 428	\$ -	\$ 428	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 1,530	\$ -	\$ 1,530	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 184	\$ 184	\$ 184	\$ 184
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 61	\$ -	\$ 61	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 10,478		\$ 10,478

**NAT - NYPA - T030 - (Segment B Enhanced)**

**F. Schodack Substation - Install**

Estimate Revision: **8**

Total: \$ **2,597,782**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>F. Schodack Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 4,050	\$ 11,250	\$ 15,300
2. SUBSTATION FOUNDATIONS	\$ 201,690	\$ 216,000	\$ 417,690
3. SUBSTATION STRUCTURES	\$ 60,680	\$ 60,680	\$ 121,360
4. MAJOR EQUIPMENT	\$ 104,000	\$ 120,000	\$ 224,000
5. SMALL EQUIPMENT / MATERIALS	\$ 316,520	\$ 226,000	\$ 542,520
6. CONTROL HOUSE / PANELS	\$ 192,815	\$ 147,815	\$ 340,630
7. MISC ITEMS	\$ 168,552	\$ 259,305	\$ 427,857
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 83,865	\$ 424,560	\$ 508,425
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,132,172	\$ 1,465,610	\$ 2,597,782
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,132,172	\$ 1,465,610	\$ 2,597,782

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>F. Schodack Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	150	CY	\$ 27	\$ 4,050	\$ 75	\$ 11,250	\$ 102	\$ 15,300
1.3	Substation Fence	0	LF	\$ 100	\$ -	\$ 100	\$ -	\$ 200	\$ -
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 4,050		\$ 11,250		\$ 15,300
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	8	EA	\$ 16,434	\$ 131,472	\$ 17,600	\$ 140,800	\$ 34,034	\$ 272,272
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3k	Arrester Stand Foundations	6	EA	\$ 2,988	\$ 17,928	\$ 3,200	\$ 19,200	\$ 6,188	\$ 37,128
2.3m	Wave Trap Stand Foundations	4	EA	\$ 2,988	\$ 11,952	\$ 3,200	\$ 12,800	\$ 6,188	\$ 24,752
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	0	EA	\$ 76,194	\$ -	\$ 81,600	\$ -	\$ 157,794	\$ -
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b	60' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c	50' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 201,690		\$ 216,000		\$ 417,690
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	2	EA	\$ 18,500	\$ 37,000	\$ 18,500	\$ 37,000	\$ 37,000	\$ 74,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	4	EA	\$ 1,850	\$ 7,400	\$ 1,850	\$ 7,400	\$ 3,700	\$ 14,800
3.3g	Instrument Transformer Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3h	Arrester Stand	6	EA	\$ 740	\$ 4,440	\$ 740	\$ 4,440	\$ 1,480	\$ 8,880
3.3j	Wave Trap Stand	2	EA	\$ 3,700	\$ 7,400	\$ 3,700	\$ 7,400	\$ 7,400	\$ 14,800
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 60,680		\$ 60,680		\$ 121,360
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200,000	\$ -	\$ 80,000	\$ -	\$ 280,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	2	EA	\$ 52,000	\$ 104,000	\$ 60,000	\$ 120,000	\$ 112,000	\$ 224,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 104,000		\$ 120,000		\$ 224,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	2	EA	\$ 33,000	\$ 66,000	\$ 15,000	\$ 30,000	\$ 48,000	\$ 96,000
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3d	CT'S	6	EA	\$ 13,000	\$ 78,000	\$ 8,000	\$ 48,000	\$ 21,000	\$ 126,000
5.3e	CCVT'S	6	EA	\$ 8,000	\$ 48,000	\$ 8,000	\$ 48,000	\$ 16,000	\$ 96,000
5.3f	Arresters	6	EA	\$ 3,420	\$ 20,520	\$ 6,000	\$ 36,000	\$ 9,420	\$ 56,520
5.3g	Wave Traps	2	EA	\$ 13,000	\$ 26,000	\$ 8,000	\$ 16,000	\$ 21,000	\$ 42,000
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 316,520		\$ 226,000		\$ 542,520
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ 551,250	\$ -	\$ 85,000	\$ -	\$ 636,250	\$ -
6.2	Protection and Telecom Equipment Panels	2	EA	\$ 35,000	\$ 70,000	\$ 12,500	\$ 25,000	\$ 47,500	\$ 95,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 122,815	\$ 122,815	\$ 122,815	\$ 122,815	\$ 245,630	\$ 245,630
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 192,815		\$ 147,815		\$ 340,630
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	530.0	LF	\$ 185.00	\$ 98,050	\$ 170.00	\$ 90,100	\$ 355	\$ 188,150
7.2	Rigid Bus, Fittings & Insulators	0.0	LF	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.3	Strain Bus, Connectors & Insulators	300.0	LF	\$ 39.35	\$ 11,790	\$ 53.35	\$ 16,005	\$ 93	\$ 27,795
7.4	Grounding System	800.0	LF	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	24	EA	\$ 1,000	\$ 24,000	\$ 550	\$ 13,200	\$ 1,550	\$ 37,200
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 14,000	\$ 14,000	\$ 70,000	\$ 70,000	\$ 84,000	\$ 84,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 20,712	\$ 20,712	\$ 70,000	\$ 70,000	\$ 90,712	\$ 90,712
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 168,552		\$ 259,305		\$ 427,857
<b>F. Schodack Substation - Install</b>					\$ 1,048,307		\$ 1,041,050		\$ 2,089,357
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 121,604	\$ 121,604	\$ 121,604	\$ 121,604
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 20,894	\$ 20,894	\$ 20,894	\$ 20,894
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 167,149	\$ 167,149	\$ 167,149	\$ 167,149
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 14,625	\$ 14,625	\$ 14,625	\$ 14,625
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 52,234	\$ 52,234	\$ 52,234	\$ 52,234
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,268	\$ 6,268	\$ 6,268	\$ 6,268
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 83,865	\$ 83,865	\$ -	\$ -	\$ 83,865	\$ 83,865
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS		\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 83,865		\$ 424,560		\$ 508,425

**NAT - NYPA - T030 - (Segment B Enhanced)**

**G. Schodack Substation - Removal**

Estimate Revision: **8**

Total: \$ **159,518**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>G. Schodack Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ 62,400	\$ 62,400
3. SUBSTATION STRUCTURES	\$ -	\$ 73,800	\$ 73,800
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:			\$ 23,318
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 136,200	\$ 159,518
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 136,200	\$ 159,518

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>G. Schodack Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	0	CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	0	LF	\$ -	\$ -	\$ 150	\$ -	\$ 150	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Steele Transmission Pole Dead Ends (1ph.) Foundations	6	EA	\$ -	\$ -	\$ 10,400	\$ 62,400	\$ 10,400	\$ 62,400
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad (40'x125')	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.5b	Generator Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 62,400		\$ 62,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1c	Switch Stands	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands	0	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand	0	EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	0	EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Misc. Structures	6	EA	\$ -	\$ -	\$ 12,300	\$ 73,800	\$ 12,300	\$ 73,800
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 73,800		\$ 73,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ -		\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps	0	EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.3c	VT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3d	CT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3e	CCVT'S	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3f	Arresters	0	EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	0	EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -
6.2	Protection and Telecom Equipment Panels	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cable	0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ -		\$ -
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	0	LS	\$ -	\$ -	\$ 10,500.00	\$ -	\$ 10,500	\$ -
7.3	Strain Bus, Connectors & Insulators	0	EA	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System	0	EA	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ -		\$ -
<b>G. Schodack Substation - Removal</b>					\$ -		\$ 136,200		\$ 136,200
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 7,927	\$ 7,927	\$ 7,927	\$ 7,927
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,362	\$ 1,362	\$ 1,362	\$ 1,362
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 10,896	\$ 10,896	\$ 10,896	\$ 10,896
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 953	\$ -	\$ 953	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 3,405	\$ -	\$ 3,405	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 409	\$ 409	\$ 409	\$ 409
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 136	\$ -	\$ 136	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 23,318		\$ 23,318

**NAT - NYPA - T030 - (Segment B Enhanced)**

**H. Churchtown Substation - Install**

Estimate Revision: **8**

Total: \$ 18,759,615

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>H. Churchtown Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 133,850	\$ 2,459,550	\$ 2,593,400
2. SUBSTATION FOUNDATIONS	\$ 964,690	\$ 1,039,500	\$ 2,004,190
3. SUBSTATION STRUCTURES	\$ 416,000	\$ 433,085	\$ 866,170
4. MAJOR EQUIPMENT	\$ 416,000	\$ 480,000	\$ 896,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,384,800	\$ 938,800	\$ 2,323,600
6. CONTROL HOUSE / PANELS	\$ 2,344,525	\$ 1,517,025	\$ 3,861,550
7. MISC ITEMS	\$ 1,013,691	\$ 1,488,020	\$ 2,501,711
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 535,251	\$ 3,177,743	\$ 3,712,994
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 7,208,807	\$ 11,533,723	\$ 18,759,615
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 7,208,807	\$ 11,533,723	\$ 18,759,615

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
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**H. Churchtown Substation - Install**

**1. SITE PREP/ GRADING/ FENCING / CIVIL**

1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	2.0	ACRES	\$ -	\$ -	\$ 1,125,000	\$ 2,250,000	\$ 1,125,000	\$ 2,250,000
1.2	Station stone within substation fence.	900	CY	\$ 27	\$ 24,300	\$ 75	\$ 67,500	\$ 102	\$ 91,800
1.3	Substation Fence	1,050	LF	\$ 100	\$ 105,000	\$ 100	\$ 105,000	\$ 200	\$ 210,000
1.4	Permanent Access Road - 20'-Wide	130	LF	\$ 35	\$ 4,550	\$ 285	\$ 37,050	\$ 320	\$ 41,600
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									

**TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL**

**2. SUBSTATION FOUNDATIONS**

<b>2.1</b>	<b>345kV</b>								
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	8	EA	\$ 5,229	\$ 41,832	\$ 5,600	\$ 44,800	\$ 10,829	\$ 86,632
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	20	EA	\$ 16,434	\$ 328,680	\$ 17,600	\$ 352,000	\$ 34,034	\$ 680,680
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	32	EA	\$ 2,988	\$ 95,616	\$ 3,200	\$ 102,400	\$ 6,188	\$ 198,016
2.3f	Fuse Stand Foundations	2	EA	\$ 2,988	\$ 5,976	\$ 3,200	\$ 6,400	\$ 6,188	\$ 12,376
2.3g	Bus Support 3ph Foundations	40	EA	\$ 2,988	\$ 119,520	\$ 3,200	\$ 128,000	\$ 6,188	\$ 247,520
2.3h	Bus Support 1 Ph Foundations	24	EA	\$ 2,988	\$ 71,712	\$ 3,200	\$ 76,800	\$ 6,188	\$ 148,512
2.3j	Instrument Transformer Stand Foundations	51	EA	\$ 2,988	\$ 152,388	\$ 3,200	\$ 163,200	\$ 6,188	\$ 315,588
2.3k	Arrester Stand Foundations	15	EA	\$ 2,988	\$ 44,820	\$ 3,200	\$ 48,000	\$ 6,188	\$ 92,820
2.3m	Wave Trap Stand Foundations	10	EA	\$ 2,988	\$ 29,880	\$ 3,200	\$ 32,000	\$ 6,188	\$ 61,880
2.3n	Station Service Foundations	1	EA	\$ 3,735	\$ 3,735	\$ 4,000	\$ 4,000	\$ 7,735	\$ 7,735
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 33,615	\$ 33,615	\$ 36,000	\$ 36,000	\$ 69,615	\$ 69,615
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribuion Line - 1ph.	1	LS	\$ -	\$ -	\$ 6,500	\$ 6,500	\$ 6,500	\$ 6,500
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	4	EA	\$ 5,229	\$ 20,916	\$ 5,600	\$ 22,400	\$ 10,829	\$ 43,316
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 964,690		\$ 1,039,500		\$ 2,004,190
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	5	EA	\$ 18,500	\$ 92,500	\$ 18,500	\$ 92,500	\$ 37,000	\$ 185,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	16	EA	\$ 7,955	\$ 127,280	\$ 7,955	\$ 127,280	\$ 15,910	\$ 254,560
3.3d	Fuse Stand	1	EA	\$ 7,955	\$ 7,955	\$ 7,955	\$ 7,955	\$ 15,910	\$ 15,910
3.3e	Bus Support 3ph	20	EA	\$ 3,330	\$ 66,600	\$ 3,330	\$ 66,600	\$ 6,660	\$ 133,200
3.3f	Bus Support 1 Ph	24	EA	\$ 1,850	\$ 44,400	\$ 1,850	\$ 44,400	\$ 3,700	\$ 88,800
3.3g	Instrument Transformer Stand	51	EA	\$ 740	\$ 37,740	\$ 740	\$ 37,740	\$ 1,480	\$ 75,480
3.3h	Arrester Stand	15	EA	\$ 740	\$ 11,100	\$ 740	\$ 11,100	\$ 1,480	\$ 22,200
3.3j	Wave Trap Stand	5	EA	\$ 3,700	\$ 18,500	\$ 3,700	\$ 18,500	\$ 7,400	\$ 37,000
3.3k	Misc. Structures	4	EA	\$ 6,475	\$ 25,900	\$ 6,475	\$ 25,900	\$ 12,950	\$ 51,800
3.3l	Station Service Transformer Support Stand	1	EA	\$ 1,110	\$ 1,110	\$ 1,110	\$ 1,110	\$ 2,220	\$ 2,220
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 433,085		\$ 433,085		\$ 866,170
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200,000	\$ -	\$ 80,000	\$ -	\$ 280,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	8	EA	\$ 52,000	\$ 416,000	\$ 60,000	\$ 480,000	\$ 112,000	\$ 896,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 416,000		\$ 480,000		\$ 896,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	5	EA	\$ 33,000	\$ 165,000	\$ 15,000	\$ 75,000	\$ 48,000	\$ 240,000
5.3b	Disconnect Switches - 3ph w/ manual operator	16	EA	\$ 28,000	\$ 448,000	\$ 17,500	\$ 280,000	\$ 45,500	\$ 728,000
5.3c	VT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3d	CT'S	15	EA	\$ 13,000	\$ 195,000	\$ 8,000	\$ 120,000	\$ 21,000	\$ 315,000
5.3e	CCVT'S	21	EA	\$ 8,000	\$ 168,000	\$ 8,000	\$ 168,000	\$ 16,000	\$ 336,000
5.3f	Arresters	15	EA	\$ 3,420	\$ 51,300	\$ 6,000	\$ 90,000	\$ 9,420	\$ 141,300
5.3g	Wave Traps	5	EA	\$ 13,000	\$ 65,000	\$ 8,000	\$ 40,000	\$ 21,000	\$ 105,000
5.3h	Station Service Transformers	1	EA	\$ 75,000	\$ 75,000	\$ 35,000	\$ 35,000	\$ 110,000	\$ 110,000
5.3j	Fuses	3	EA	\$ 7,500	\$ 22,500	\$ 3,600	\$ 10,800	\$ 11,100	\$ 33,300

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,384,800		\$ 938,800		\$ 2,323,600
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 292,500	\$ 292,500	\$ 85,000	\$ 85,000	\$ 377,500	\$ 377,500
6.2	Protection and Telecom Equipment Panels	30	EA	\$ 35,000	\$ 1,050,000	\$ 10,000	\$ 300,000	\$ 45,000	\$ 1,350,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 487,025	\$ 487,025	\$ 487,025	\$ 487,025	\$ 974,050	\$ 974,050
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,344,525		\$ 1,517,025		\$ 3,861,550
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,300.0	LF	\$ 185.00	\$ 240,500	\$ 170.00	\$ 221,000	\$ 355	\$ 461,500
7.2	Rigid Bus, Fittings & Insulators	1,800.0	LF	\$ 125.07	\$ 225,126	\$ 237.10	\$ 426,780	\$ 362	\$ 651,906
7.3	Strain Bus, Connectors & Insulators	1,000.0	LF	\$ 39.30	\$ 39,300	\$ 53.35	\$ 53,350	\$ 93	\$ 92,650
7.4	Grounding System	10,500.0	LF	\$ 6.93	\$ 72,765	\$ 32.58	\$ 342,090	\$ 40	\$ 414,855
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	36	EA	\$ 1,000	\$ 36,000	\$ 550	\$ 19,800	\$ 1,550	\$ 55,800
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,013,691		\$ 1,488,020		\$ 2,501,711
<b>H. Churchtown Substation - Install</b>					\$ 6,690,641		\$ 8,355,980		\$ 15,046,621
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 150,466	\$ 150,466	\$ 150,466	\$ 150,466
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 875,736	\$ 875,736	\$ 875,736	\$ 875,736
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 150,466	\$ 150,466	\$ 150,466	\$ 150,466
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 150,466	\$ 150,466	\$ 150,466	\$ 150,466
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,203,730	\$ 1,203,730	\$ 1,203,730	\$ 1,203,730
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	Site	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 105,326	\$ 105,326	\$ 105,326	\$ 105,326
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 376,166	\$ 376,166	\$ 376,166	\$ 376,166
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 45,140	\$ 45,140	\$ 45,140	\$ 45,140
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 91,200	\$ 91,200	\$ 91,200	\$ 91,200
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 535,251	\$ 535,251	\$ -	\$ -	\$ 535,251	\$ 535,251
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 15,047	\$ 15,047	\$ 15,047	\$ 15,047
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 535,251	\$ -	\$ 3,177,743	\$ -	\$ 3,712,994

**NAT - NYPA - T030 - (Segment B Enhanced)**

**I. Churchtown Substation - Removal**

Estimate Revision: **8** Total: \$ **1,128,661**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>I. Churchtown Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ 111,000	\$ 111,000
2. SUBSTATION FOUNDATIONS	\$ -	\$ 340,400	\$ 340,400
3. SUBSTATION STRUCTURES	\$ -	\$ 252,600	\$ 252,600
4. MAJOR EQUIPMENT	\$ -	\$ 24,600	\$ 24,600
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ 60,000	\$ 60,000
6. CONTROL HOUSE / PANELS	\$ -	\$ 150,000	\$ 150,000
7. MISC ITEMS	\$ -	\$ 25,078	\$ 25,078
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ 164,983	\$ 164,983
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ 1,128,661	\$ 1,128,661
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ 1,128,661	\$ 1,128,661

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. Churchtown Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.		ACRES	\$ -	\$ -	\$ 250,000	\$ -	\$ 250,000	\$ -
1.2	Station stone within substation fence.		CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence	740	LF	\$ -	\$ -	\$ 150	\$ 111,000	\$ 150	\$ 111,000
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ 111,000		\$ 111,000
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Reactor Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations		EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -
2.2b	Capacitor Bank Foundations		EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -
2.2e	Switch Stand Foundations		EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -
2.2f	Station Service Transformer Stand Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2j	Instrument Transformer Stand Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2k	Arrester Stand Foundations		EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -
2.2m	Wave Trap Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	2	EA	\$ -	\$ -	\$ 15,000	\$ 30,000	\$ 15,000	\$ 30,000
2.3b	Capacitor Bank Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3e	Switch Stand Foundations	18	EA	\$ -	\$ -	\$ 5,200	\$ 93,600	\$ 5,200	\$ 93,600
2.3f	Fuse Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3h	Bus Support 1 Ph Foundations	6	EA	\$ -	\$ -	\$ 5,200	\$ 31,200	\$ 5,200	\$ 31,200
2.3j	Instrument Transformer Stand Foundations	3	EA	\$ -	\$ -	\$ 5,200	\$ 15,600	\$ 5,200	\$ 15,600
2.3k	Arrester Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Steel Transmission Pole Deadend Fnds (1Ph)	9	EA	\$ -	\$ -	\$ 15,000	\$ 135,000	\$ 15,000	\$ 135,000
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ 67,500	\$ -	\$ 67,500	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ -	\$ -	\$ 14,200	\$ 14,200	\$ 14,200	\$ 14,200
2.5b	Generator Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	4	EA	\$ -	\$ -	\$ 5,200	\$ 20,800	\$ 5,200	\$ 20,800
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -		\$ 340,400		\$ 340,400
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1b	Substation A-Frame Structures - Shared Column		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1c	Switch Stands		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1d	Station Service Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1e	Bus Support 3ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1h	Arrester Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1j	Wave Trap Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1k	Misc. Structures		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone		EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2b	Substation A-Frame Structures - Shared Column		EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -
3.2c	Switch Stands		EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -
3.2d	Station Service Transformer Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2e	Bus Support 3ph		EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2f	Bus Support 1 Ph		EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -
3.2g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand		EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands	9	EA	\$ -	\$ -	\$ 6,450	\$ 58,050	\$ 6,450	\$ 58,050
3.3d	Fuse Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph	6	EA	\$ -	\$ -	\$ 6,450	\$ 38,700	\$ 6,450	\$ 38,700
3.3g	Instrument Transformer Stand	3	EA	\$ -	\$ -	\$ 6,450	\$ 19,350	\$ 6,450	\$ 19,350
3.3h	Arrester Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Steel Transmission Pole Deadend (1Ph)	9	EA	\$ -	\$ -	\$ 12,300	\$ 110,700	\$ 12,300	\$ 110,700
3.4l	Lightning Mast	4	EA	\$ -	\$ -	\$ 6,450	\$ 25,800	\$ 6,450	\$ 25,800
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -		\$ 252,600		\$ 252,600
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers		EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	2	EA	\$ -	\$ -	\$ 12,300	\$ 24,600	\$ 12,300	\$ 24,600
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -		\$ 24,600		\$ 24,600
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.1a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3b	Disconnect Switches - 3ph w/ manual operator	3	EA	\$ -	\$ -	\$ 5,500	\$ 16,500	\$ 5,500	\$ 16,500
5.3c	VT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3d	CT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3e	CCVT'S	3	EA	\$ -	\$ -	\$ 1,500	\$ 4,500	\$ 1,500	\$ 4,500
5.3f	Arresters	9	EA	\$ -	\$ -	\$ 1,500	\$ 13,500	\$ 1,500	\$ 13,500
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ -		\$ 60,000		\$ 60,000
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ -	\$ -	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
6.2	Protection and Telecom Equipment Panels		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.3	125VDC Batteries		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.4	Control Cables		LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.5	SCADA and Communications		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.7	DC Distribution System		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.8	Security		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.9	Fire Alarm		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.10	Generator		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ -		\$ 150,000		\$ 150,000
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.2	Rigid Bus, Fittings & Insulators	535.0	LF	\$ -	\$ -	\$ 46.88	\$ 25,078	\$ 47	\$ 25,078

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
7.3	Strain Bus, Connectors & Insulators		LF	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -
7.4	Grounding System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -
7.5									
7.6									
7.7									
7.8									
7.9									
7.10									
7.11									
7.12									
7.13									
7.14									
7.15									
<b>TOTAL - MISC ITEMS</b>					\$ -		\$ 25,078		\$ 25,078
<b>I. Churchtown Substation - Removal</b>					\$ -		\$ 963,678		\$ 963,678
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 9,637	\$ 9,637	\$ 9,637	\$ 9,637
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 56,088	\$ 56,088	\$ 56,088	\$ 56,088
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 9,637	\$ 9,637	\$ 9,637	\$ 9,637
8.4	Site Accommodation, Facilities, Storage	1.0	LS	\$ -	\$ -	\$ 9,637	\$ 9,637	\$ 9,637	\$ 9,637
<b>Engineering</b>									
8.5	Design Engineering	1.0	LS	\$ -	\$ -	\$ 77,094	\$ 77,094	\$ 77,094	\$ 77,094
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ 6,746	\$ -	\$ 6,746	\$ -
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ 24,092	\$ -	\$ 24,092	\$ -
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 2,891	\$ 2,891	\$ 2,891	\$ 2,891
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1.0	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ 964	\$ -	\$ 964	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ -		\$ 164,983		\$ 164,983

**NAT - NYPA - T030 - (Segment B Enhanced)**

**J. Pleasant Valley Substation - Install**

Estimate Revision: **8**

Total: \$ **3,490,140**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>J. Pleasant Valley Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 11,025	\$ 14,625	\$ 25,650
2. SUBSTATION FOUNDATIONS	\$ 151,466	\$ 160,900	\$ 312,366
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 260,500	\$ 129,000	\$ 389,500
6. CONTROL HOUSE / PANELS	\$ 560,900	\$ 253,400	\$ 814,300
7. MISC ITEMS	\$ 409,950	\$ 457,275	\$ 867,225
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 131,059	\$ 581,239	\$ 712,299
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,769,300	\$ 1,720,839	\$ 3,490,140
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,769,300	\$ 1,720,839	\$ 3,490,140

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Pleasant Valley Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 203,000	\$ -	\$ 203,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	90	LF	\$ 100	\$ 9,000	\$ 100	\$ 9,000	\$ 200	\$ 18,000
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 11,025		\$ 14,625		\$ 25,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House Addition Foundation (25-ft x 50-ft)	1	EA	\$ 51,368	\$ 51,368	\$ 53,700	\$ 53,700	\$ 105,068	\$ 105,068
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 151,466		\$ 160,900		\$ 312,366
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 44,400		\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 200,000		\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 111,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 8,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 260,500		\$ 129,000		\$ 389,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE Addition (25-ft x 50-ft)	1	EA	\$ 325,000	\$ 325,000	\$ 85,000	\$ 85,000	\$ 410,000	\$ 410,000
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 12,500	\$ 37,500	\$ 47,500	\$ 142,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 130,900	\$ 130,900	\$ 130,900	\$ 130,900	\$ 261,800	\$ 261,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 560,900		\$ 253,400		\$ 814,300
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	LS	\$ 15,008.40	\$ -	\$ 56,904.00	\$ -	\$ 71,912	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 13.38	\$ 33,450	\$ 39.35	\$ 98,375	\$ 53	\$ 131,825
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	38	EA	\$ 2,000	\$ 76,000	\$ 1,050	\$ 39,900	\$ 3,050	\$ 115,900
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 62,500	\$ 62,500	\$ 75,000	\$ 75,000	\$ 137,500	\$ 137,500
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 90,000	\$ 90,000	\$ 108,000	\$ 108,000	\$ 198,000	\$ 198,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 409,950		\$ 457,275		\$ 867,225
<b>J. Pleasant Valley Substation - Install</b>					\$ 1,638,241		\$ 1,139,600		\$ 2,777,841
<b>8. MOB/DEMOb, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 27,778	\$ 27,778	\$ 27,778	\$ 27,778
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 161,675	\$ 161,675	\$ 161,675	\$ 161,675
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 27,778	\$ 27,778	\$ 27,778	\$ 27,778
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 27,778	\$ 27,778	\$ 27,778	\$ 27,778
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 222,227	\$ 222,227	\$ 222,227	\$ 222,227
8.6	LiDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 19,445	\$ 19,445	\$ 19,445	\$ 19,445

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 69,446	\$ 69,446	\$ 69,446	\$ 69,446
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 8,334	\$ 8,334	\$ 8,334	\$ 8,334
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 131,059	\$ 131,059	\$ -	\$ -	\$ 131,059	\$ 131,059
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 2,778	\$ 2,778	\$ 2,778	\$ 2,778
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 131,059		\$ 581,239		\$ 712,299

**NAT - NYPA - T030 - (Segment B Enhanced)**

**N. Interconnection Milan Station**

Estimate Revision: **8**

Total: \$ **742,607**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>N. Interconnection Milan Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 121,100	\$ 121,100
2. FOUNDATIONS	\$ 84,375	\$ 135,279	\$ 219,654
3. STRUCTURES	\$ 130,328	\$ 88,667	\$ 218,994
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 45,200	\$ 18,480	\$ 63,680
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 20,792	\$ 98,387	\$ 119,179
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 280,695	\$ 461,912	\$ 742,607
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 280,695	\$ 461,912	\$ 742,607

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Milan Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	1.0	Acre	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	500.0	LF	\$ -	\$ -	\$ 4	\$ 2,000	\$ 4	\$ 2,000
1.5	Matting - Access and ROW	500.0	LF	\$ -	\$ -	\$ 70	\$ 35,000	\$ 70	\$ 35,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	10,000.0	SF	\$ -	\$ -	\$ 4	\$ 35,200	\$ 4	\$ 35,200
1.10	Restoration for Work Pad areas	2,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 300	\$ 0	\$ 300
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -	\$ 121,100	\$ 121,100		\$ 121,100
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115KV Single Circuit Single Pole Angle/DE	2	EA	\$ 42,187	\$ 84,375	\$ 42,639	\$ 85,279	\$ 84,827	\$ 169,654
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	25	CY	\$ -	\$ -	\$ 2,000	\$ 50,000	\$ 2,000	\$ 50,000
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 84,375	\$ 135,279	\$ 135,279		\$ 219,654

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	2	Structure	\$ 64,658	\$ 129,316	\$ 38,795	\$ 77,590	\$ 103,453	\$ 206,905
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	2	Pole	\$ 506	\$ 1,012	\$ 5,539	\$ 11,077	\$ 6,045	\$ 12,089
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 130,328		\$ 88,667		\$ 218,994
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9		-							
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	24	Assembly	\$ 1,800	\$ 43,200	\$ 720	\$ 17,280	\$ 2,520	\$ 60,480
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5		-	Assembly		\$ -		\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.10	OPGW Splice Boxes	-	Set	\$ 1,746	\$ -	\$ 2,274	\$ -	\$ 4,020	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 2,520	\$ -	\$ 2,520	\$ -	\$ 5,040	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 45,200		\$ 18,480		\$ 63,680
<b>N. Interconnection Milan Station</b>					\$ 259,903		\$ 363,525		\$ 623,428
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 6,234	\$ 6,234	\$ 6,234	\$ 6,234
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 36,284	\$ 36,284	\$ 36,284	\$ 36,284
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 6,234	\$ 6,234	\$ 6,234	\$ 6,234
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 6,234	\$ 6,234	\$ 6,234	\$ 6,234
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 31,171	\$ 31,171	\$ 31,171	\$ 31,171

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 1,870	\$ 1,870	\$ 1,870	\$ 1,870
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 4,364	\$ 4,364	\$ 4,364	\$ 4,364
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,870	\$ 1,870	\$ 1,870	\$ 1,870
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 20,792	\$ 20,792	\$ -	\$ -	\$ 20,792	\$ 20,792
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 623	\$ 623	\$ 623	\$ 623
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 20,792		\$ 98,387		\$ 119,179

**NAT - NYPA - T030 - (Segment B Enhanced)**

**L. Interconnection Knickerbocker Station**

Estimate Revision: **8** Total: \$ **1,487,366**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>L. Interconnection Knickerbocker Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 482,850	\$ 482,850
2. FOUNDATIONS	\$ 89,638	\$ 195,674	\$ 285,311
3. STRUCTURES	\$ 249,838	\$ 197,017	\$ 446,855
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 29,466	\$ 17,754	\$ 47,220
6. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 29,515	\$ 195,614	\$ 225,130
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 398,458	\$ 1,088,909	\$ 1,487,366
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 398,458	\$ 1,088,909	\$ 1,487,366

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Knickerbocker Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	675.0	LF	\$ -	\$ -	\$ 70	\$ 47,250	\$ 70	\$ 47,250
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	45,000.0	SF	\$ -	\$ -	\$ 4	\$ 158,400	\$ 4	\$ 158,400
1.10	Restoration for Work Pad areas	9,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,350	\$ 0	\$ 1,350
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 482,850		\$ 482,850
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 115KV 3-POLE TANGENT DEADEND (0°-5°)	6	EA	\$ 3,025	\$ 18,150	\$ 20,570	\$ 123,420	\$ 23,595	\$ 141,570
2.2	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	3	EA	\$ 23,829	\$ 71,488	\$ 24,085	\$ 72,254	\$ 47,914	\$ 143,741
2.3									
2.4									
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 89,638		\$ 195,674		\$ 285,311
<b>3. STRUCTURES</b>									
3.1	1-CKT 115KV 3-POLE TANGENT DEADEND (0°-5°)	2	Structure	\$ 76,177	\$ 152,355	\$ 45,706	\$ 91,413	\$ 121,884	\$ 243,768
3.2	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	1	Structure	\$ 92,929	\$ 92,929	\$ 55,758	\$ 55,758	\$ 148,687	\$ 148,687
3.3					\$ -		\$ -		\$ -
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	9	Pole	\$ 506	\$ 4,554	\$ 5,539	\$ 49,847	\$ 6,045	\$ 54,401
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 249,838		\$ 197,017		\$ 446,855
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9		-							
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	12	Assembly	\$ 900	\$ 10,800	\$ 560	\$ 6,720	\$ 1,460	\$ 17,520
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	7	Assembly	\$ 1,800	\$ 12,600	\$ 720	\$ 5,040	\$ 2,520	\$ 17,640
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.5		-	Assembly	\$ 900	\$ -	\$ 360	\$ -	\$ 1,260	\$ -
5.6	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.7	OPGW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.8	OHSW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.9	OHSW Assembly - Angle / DE	2	Assembly	\$ 250	\$ 500	\$ 150	\$ 300	\$ 400	\$ 800
5.10	OPGW Splice Boxes	1	Set	\$ 1,746	\$ 1,746	\$ 2,274	\$ 2,274	\$ 4,020	\$ 4,020
5.11	OPGW Splice & Test	1	EA	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 5,040	\$ 5,040
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 29,466		\$ 17,754		\$ 47,220
<b>L. Interconnection Knickerbocker Station</b>									
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 368,942		\$ 893,294		\$ 1,262,237
<b>Contractor Mobilization / Demobilization</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 12,622	\$ 12,622	\$ 12,622	\$ 12,622
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 73,464	\$ 73,464	\$ 73,464	\$ 73,464
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 12,622	\$ 12,622	\$ 12,622	\$ 12,622
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 12,622	\$ 12,622	\$ 12,622	\$ 12,622
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 63,112	\$ 63,112	\$ 63,112	\$ 63,112
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 3,787	\$ 3,787	\$ 3,787	\$ 3,787
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 8,836	\$ 8,836	\$ 8,836	\$ 8,836
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 3,787	\$ 3,787	\$ 3,787	\$ 3,787
6.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 29,515	\$ 29,515	\$ -	\$ -	\$ 29,515	\$ 29,515
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 1,262	\$ 1,262	\$ 1,262	\$ 1,262
	<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>				\$ 29,515		\$ 195,614		\$ 225,130

**NAT - NYPA - T030 - (Segment B Enhanced)**

**M. Interconnection Churchtown Station**

Estimate Revision: **8** Total: \$ **2,540,063**

NAT - NYPA - T030 - (Segment B Enhanced)			
	Supply	Installation	Total
<b>M. Interconnection Churchtown Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 525,600	\$ 525,600
2. FOUNDATIONS	\$ 231,719	\$ 334,201	\$ 565,920
3. STRUCTURES	\$ 563,647	\$ 401,007	\$ 964,654
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 58,666	\$ 27,354	\$ 86,020
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 68,323	\$ 329,545	\$ 397,868
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>922,355</b>	\$ <b>1,617,707</b>	\$ <b>2,540,063</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>922,355</b>	\$ <b>1,617,707</b>	\$ <b>2,540,063</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Churchtown Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	60,000.0	SF	\$ -	\$ -	\$ 4	\$ 211,200	\$ 4	\$ 211,200
1.10	Restoration for Work Pad areas	12,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,800	\$ 0	\$ 1,800
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 525,600		\$ 525,600
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	6	EA	\$ 18,077	\$ 108,464	\$ 18,271	\$ 109,626	\$ 36,348	\$ 218,090
2.2	2x 1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	6	EA	\$ 20,543	\$ 123,255	\$ 20,763	\$ 124,575	\$ 41,305	\$ 247,830
2.3									
2.4									
2.5	Rock Excavation Adder	50	CY	\$ -	\$ -	\$ 2,000	\$ 100,000	\$ 2,000	\$ 100,000
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 231,719		\$ 334,201		\$ 565,920
<b>3. STRUCTURES</b>									
3.1	1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	2	Structure	\$ 92,929	\$ 185,858	\$ 55,758	\$ 111,515	\$ 148,687	\$ 297,373
3.2	2x 1-CKT 115KV 3-POLE LARGE ANGLE DEADEND (60°-90°)	2	Structure	\$ 185,858	\$ 371,717	\$ 111,515	\$ 223,030	\$ 297,373	\$ 594,747
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	12	Pole	\$ 506	\$ 6,072	\$ 5,539	\$ 66,462	\$ 6,045	\$ 72,534
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 563,647		\$ 401,007		\$ 964,654
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115KV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kv - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9		-							
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kv Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kv Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kv Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	28	Assembly	\$ 1,800	\$ 50,400	\$ 720	\$ 20,160	\$ 2,520	\$ 70,560
5.4	115kv Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.5		-	Assembly	\$ -	\$ -	\$ 360	\$ -	\$ 360	\$ -
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	8	Assembly	\$ 250	\$ 2,000	\$ 150	\$ 1,200	\$ 400	\$ 3,200
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	8	Assembly	\$ 250	\$ 2,000	\$ 150	\$ 1,200	\$ 400	\$ 3,200
5.10	OPGW Splice Boxes	1	Set	\$ 1,746	\$ 1,746	\$ 2,274	\$ 2,274	\$ 4,020	\$ 4,020
5.11	OPGW Splice & Test	1	EA	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 5,040	\$ 5,040
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 58,666		\$ 27,354		\$ 86,020
<b>M. Interconnection Churchtown Station</b>						\$ 854,033		\$ 1,288,162	\$ 2,142,195
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 21,422	\$ 21,422	\$ 21,422	\$ 21,422
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 124,679	\$ 124,679	\$ 124,679	\$ 124,679
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 21,422	\$ 21,422	\$ 21,422	\$ 21,422
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 21,422	\$ 21,422	\$ 21,422	\$ 21,422
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 107,110	\$ 107,110	\$ 107,110	\$ 107,110
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 6,427	\$ 6,427	\$ 6,427	\$ 6,427
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 14,995	\$ 14,995	\$ 14,995	\$ 14,995
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,427	\$ 6,427	\$ 6,427	\$ 6,427
6.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 68,323	\$ 68,323	\$ -	\$ -	\$ 68,323	\$ 68,323
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,142	\$ 2,142	\$ 2,142	\$ 2,142
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 68,323		\$ 329,545		\$ 397,868

**NAT - NYPA - T030 - (Segment B Enhanced)**

**N. Interconnection Pleasant Valley**

Estimate Revision: **8** Total: \$ **2,679,858**

<b>NAT - NYPA - T030 - (Segment B Enhanced)</b>			
	<i>Supply</i>	<i>Installation</i>	<i>Total</i>
<b>N. Interconnection Pleasant Valley</b>			
1. CLEARING & ACCESS	\$ -	\$ 578,850	\$ 578,850
2. FOUNDATIONS	\$ 61,875	\$ 790,750	\$ 852,625
3. STRUCTURES	\$ 388,477	\$ 311,610	\$ 700,087
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 105,566	\$ 47,094	\$ 152,660
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 44,473	\$ 351,162	\$ 395,636
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>600,392</b>	\$ <b>2,079,466</b>	\$ <b>2,679,858</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>600,392</b>	\$ <b>2,079,466</b>	\$ <b>2,679,858</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>N. Interconnection Pleasant Valley</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	75,000.0	SF	\$ -	\$ -	\$ 4	\$ 264,000	\$ 4	\$ 264,000
1.10	Restoration for Work Pad areas	15,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 2,250	\$ 0	\$ 2,250
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18					\$ -		\$ -		\$ -
1.19					\$ -		\$ -		\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 578,850		\$ 578,850
<b>2. FOUNDATIONS</b>									
2.1	1-CKT 115KV 3-POLE TANGENT DEADEND (0°-5°)	15	EA	\$ 4,125	\$ 61,875	\$ 28,050	\$ 420,750	\$ 32,175	\$ 482,625
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	185	CY	\$ -	\$ -	\$ 2,000	\$ 370,000	\$ 2,000	\$ 370,000
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 61,875		\$ 790,750		\$ 852,625
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	5	Structure	\$ 76,177	\$ 380,887	\$ 45,706	\$ 228,532	\$ 121,884	\$ 609,420
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	15	Pole	\$ 506	\$ 7,590	\$ 5,539	\$ 83,078	\$ 6,045	\$ 90,668
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 388,477		\$ 311,610		\$ 700,087
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	105	Assembly	\$ 900	\$ 94,500	\$ 360	\$ 37,800	\$ 1,260	\$ 132,300
5.5			Assembly		\$ -		\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	14	Assembly	\$ 200	\$ 2,800	\$ 150	\$ 2,100	\$ 350	\$ 4,900
5.7	OPGW Assembly - Angle / DE	1	Assembly	\$ 250	\$ 250	\$ 150	\$ 150	\$ 400	\$ 400
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	15	Assembly	\$ 250	\$ 3,750	\$ 150	\$ 2,250	\$ 400	\$ 6,000
5.10	OPGW Splice Boxes	1	Set	\$ 1,746	\$ 1,746	\$ 2,274	\$ 2,274	\$ 4,020	\$ 4,020
5.11	OPGW Splice & Test	1	EA	\$ 2,520	\$ 2,520	\$ 2,520	\$ 2,520	\$ 5,040	\$ 5,040
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 105,566		\$ 47,094		\$ 152,660
<b>N. Interconnection Pleasant Valley</b>					\$ 555,918		\$ 1,728,304		\$ 2,284,222
<b>6. MOB/DEMOb, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 22,842	\$ 22,842	\$ 22,842	\$ 22,842
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 132,945	\$ 132,945	\$ 132,945	\$ 132,945
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 22,842	\$ 22,842	\$ 22,842	\$ 22,842
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 22,842	\$ 22,842	\$ 22,842	\$ 22,842
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 114,211	\$ 114,211	\$ 114,211	\$ 114,211
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 6,853	\$ 6,853	\$ 6,853	\$ 6,853
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 15,990	\$ 15,990	\$ 15,990	\$ 15,990
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,853	\$ 6,853	\$ 6,853	\$ 6,853
6.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 44,473	\$ 44,473	\$ -	\$ -	\$ 44,473	\$ 44,473
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 2,284	\$ 2,284	\$ 2,284	\$ 2,284
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 44,473		\$ 351,162		\$ 395,636

**NAT & NYPA - T030 - (Segment B)**

**O. NUF to mitigate NY to NE interface transfer limit degradation**

Estimate  
Revision: **8**

**Total: \$ 26,785,714**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>SUF 1</b>	<b>Transmission Line Upgrade Cricket Valley - Connecticut Border to Long Mountain</b>								
1.1	Line Upgrade	1.00	LS		\$ -		\$ -	\$ 21,428,571	\$ 21,428,571
	<b>Subtotal SUF 1 Direct Cost</b>				\$ -		\$ -		\$ 21,428,571
1.2	Engineering, T&C, PM, Indirects (25%)				\$ -				\$ 5,357,143
	<b>TOTAL:</b>								<b>\$ 26,785,714</b>

NAT - NYPA - T029 - (Segment B Enhanced)

P. NUF proposed as element of the Project (Middletown Line and Terminal)

Estimate Revision: 8

Total: #REF!

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
SUF SS1	Middletown Tap Transformer Replacement	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 10,878,348	\$ 10,879,000
SUF SS1	Removals	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 360,000	\$ 360,000
SUF SS1	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 2,810,000
<b>SUF SS1</b>	<b>SUF SS1 - TOTAL:</b>				\$ -		\$ -		\$ 14,049,000
SUF SS2	Middletown Line Upgrade	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SUF SS2	138kV - (1) 1113kcmil 45/7 ACSS "Bluejay" Conductor	29,272.32	LF	\$ 4.00	\$ 117,089	\$ 5.00	\$ 146,362	\$ 9	\$ 263,451
SUF SS2	Remove Existing 1033.5kml ACSR "Ortalon" Conductor and Accessories	0.88	Mile	\$ -	\$ -	\$ 30,000.00	\$ 26,400	\$ 30,000	\$ 26,400
SUF SS2	Rider Poles	3.00	Sets	\$ 1,750.00	\$ 5,250	\$ 3,500.00	\$ 10,500	\$ 5,250	\$ 15,750
SUF SS2	138kV Vertical Tangent Insulator Assembly	18.00	Assembly	\$ 900.00	\$ 16,200	\$ 560.00	\$ 10,080	\$ 1,460	\$ 26,280
SUF SS2	138kV Deadend Insulator Assembly	30.00	Assembly	\$ 900.00	\$ 27,000	\$ 560.00	\$ 16,800	\$ 1,460	\$ 43,800
SUF SS2	Engineering, T&C, PM, Indirects (25%)		LS %						\$ 94,000
<b>SUF SS2</b>	<b>SUFSS 2 - TOTAL:</b>				\$ 165,539		\$ 210,142		\$ 469,681
<b>STATIONS SUF DIRECT TOTAL:</b>									\$ 11,615,000
<b>STATIONS SUF INDIRECT TOTAL:</b>									\$ 2,904,000
<b>STATIONS SUF TOTAL</b>									\$ 14,519,000

**NAT - NYPA - T030 - (Segment B Enhanced)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type. 20% of the total length of the line is assumed to use Type 1 Gravel road and 80% of the line length access to be used wood matting. In addition 75 feet of wood matting is included from the access matting to the work pad area matting. The estimate also include 5,000 square feet of wood matting for each structure work area within the ROW. For the ground restoration (seed, straw and woven mat), 20% of the work pad area included.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 5.061% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	Knickerbocker to Churchtown substation; 0.4 miles of 345kV conductor from the junction have been added.
25	An additional Quantity of 5% have been added to conductors, OPGW, & OHSW for sag and jumpers.
26	Rock excavation depth in Foundation data provided in the proposal.
27	Middletown to Shoemaker Line upgrade: The length of the line segment is 0.88 miles -The re-conductor will remove the existing 2 bundle 1033.5 ACSR conductor and install new 2 bundle Bluejay 1113 ACSS conductor -The Insulators and associated conductor hardware will be replaced -The existing structures are assumed to have adequate strength to support the new conductors -The estimate is a rough order of magnitude estimate as no engineering was performed and SECo did not have access to record drawings.
28	Cricket Valley to Long Mountain line upgrade: Network Upgrade (NUF) costs to mitigate NY to NE interface transfer limit degradation were based on possible solutions identified during the June 2018 SIS process
29	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.



ITC (T032)			
Description		Total Amount (In thousand \$)	
Direct Cost	<b>1</b>	<b>Transmission Lines</b>	
	1.1	Clearing & Access	\$35,253
	1.2	Foundations	\$82,888
	1.3	Structures	\$67,205
	1.4	Conductor, Shiedwire and Optical Ground Wire	\$33,769
	1.5	Insulators, Fitting and Hardwares	\$16,154
	Subtotal (1)		<b>\$235,269</b>
	<b>2</b>	<b>Substations</b>	
	2.1	Knickerbocker Substation	\$21,112
	2.2	East Greenbush Substation	\$0
	2.3	Schodack Substation	\$0
	2.4	Churchtown Substation	\$1,977
	2.5	Pleasant Valley Substation	\$3,101
	2.6	Substation Interconnections	\$5,764
Subtotal (2)		<b>\$31,954</b>	
Total (1+2)		\$267,224	
Contractors Mark-up (15% of Total 1+2)		\$40,084	
Total Direct Cost (A)		<b>\$307,307</b>	
Indirect Cost	<b>3</b>	<b>Technical Services Costs</b>	
	3.1	Contractor Mobilization / Demobilization	\$2,672
	3.2	Project Management, Material Handling & Amenities	\$18,202
	3.3	Engineering	\$16,986
	3.4	Testing & Commissioning	\$755
	3.5	Permitting, Real Estate, Sales Tax and Additional Costs	\$16,833
	3.6	Legal, Environmental Licensing & Permitting and Environmental Mitigation	\$7,628
Total Indirect Cost (3)		<b>\$63,075</b>	
Subtotal Project Cost (B=A+3) 2017 \$		<b>\$370,382</b>	
	<b>4</b>	<b>Network Upgrade Facilities (NUF)</b>	
	4.1	NUF proposed as element of the Project	\$0
	4.2	NUF to mitigate NY to NE interface transfer limit degradation	\$30,000
Subtotal NUF Cost (C)		<b>\$30,000</b>	
Total Project Cost (B+C) 2017 \$		<b>\$400,382</b>	
Total Project Cost 2018 \$		<b>\$412,394</b>	

**ITC T032 (Segment B)**

Estimate Revision: 8

<i>ITC T032 (Segment B) Direct Costs</i>		<i>Total Each Segment</i>
Direct Labor, Material & Equipment Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 78,044,105
Direct Labor, Material & Equipment Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 152,478,922
Direct Labor, Material & Equipment Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 4,746,361
Direct Labor, Material & Equipment Costs	D. Knickerbocker 345kV Substation - Install	\$ 21,112,147
Direct Labor, Material & Equipment Costs	E. Greenbush Substation - Removal	\$ -
Direct Labor, Material & Equipment Costs	F.	\$ -
Direct Labor, Material & Equipment Costs	G.	\$ -
Direct Labor, Material & Equipment Costs	H. Churchtown Substation - Install	\$ 1,977,418
Direct Labor, Material & Equipment Costs	I. Churchtown Substation - Removal	\$ -
Direct Labor, Material & Equipment Costs	J. Pleasant Valley Substation - Install	\$ 3,101,141
Direct Labor, Material & Equipment Costs	K. Interconnection Knickerbocker Station	\$ 3,068,229
Direct Labor, Material & Equipment Costs	L. Interconnection Churchtown Station	\$ 2,061,784
Direct Labor, Material & Equipment Costs	M. Interconnection Milan Station	\$ 633,514
Direct Labor, Material & Equipment Costs	N. NUF to mitigate NY to NE interface transfer limit degradation	\$ 21,428,571
Direct Labor, Material & Equipment Costs	O. NUF proposed as element of the Project	\$ -
<b>SUBTOTAL:</b>		<b>\$ 288,652,192</b>
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>		<b>\$ 43,297,829</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>		<b>\$ -</b>
<b>TOTAL DIRECT:</b>		<b>\$ 331,950,021</b>

<i>ITC T032 (Segment B) Indirect Costs</i>		<i>Total Each Segment</i>
Indirect Costs	A. Transmission Line Knickerbocker to Churchtown	\$ 16,685,500
Indirect Costs	B. Transmission Line Churchtown to Pleasant Valley	\$ 30,319,058
Indirect Costs	C. Blue Stores Junction to Blue Stores Substation	\$ 936,585
Indirect Costs	D. Knickerbocker 345kV Substation - Install	\$ 5,266,744
Indirect Costs	E. Greenbush Substation - Removal	\$ -
Indirect Costs	F.	\$ -
Indirect Costs	G.	\$ -
Indirect Costs	H. Churchtown Substation - Install	\$ 475,504
Indirect Costs	I. Churchtown Substation - Removal	\$ -
Indirect Costs	J. Pleasant Valley Substation - Install	\$ 754,800
Indirect Costs	K. Interconnection Knickerbocker Station	\$ 554,805
Indirect Costs	L. Interconnection Churchtown Station	\$ 342,513
Indirect Costs	M. Interconnection Milan Station	\$ 111,797
Indirect Costs	N. NUF to mitigate NY to NE interface transfer limit degradation	\$ 5,357,143
Indirect Costs	O. NUF proposed as element of the Project	\$ -
Indirect Costs	Legal and Permitting (Includes Legal, Envir. Lisc. & Permit., and Envir. Mitigation)	\$ 7,627,609
<b>TOTAL INDIRECT:</b>		<b>\$ 68,432,059</b>

**TOTAL ESTIMATED COST: \$ 400,382,079**

**ITC T032 (Segment B)**

**A. Transmission Line Knickerbocker to Churchtown**

Estimate Revision: 8

Total: \$ 94,729,605

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>A. Transmission Line Knickerbocker to Churchtown</b>			
1. CLEARING & ACCESS	\$ 11,500	\$ 13,507,953	\$ 13,519,453
2. FOUNDATIONS	\$ 12,695,824	\$ 13,995,790	\$ 26,691,613
3. STRUCTURES	\$ 10,287,616	\$ 11,532,261	\$ 21,819,877
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 2,339,147	\$ 8,681,855	\$ 11,021,002
5. INSULATORS, FITTINGS, HARDWARE	\$ 3,305,711	\$ 1,686,448	\$ 4,992,160
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 2,291,184	\$ 14,394,316	\$ 16,685,500
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 30,930,982	\$ 63,798,623	\$ 94,729,605
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 30,930,982	\$ 63,798,623	\$ 94,729,605

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>A. Transmission Line Knickerbocker to Churchtown</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	19.0	Acre	\$ -	\$ -	\$ 15,000	\$ 285,000	\$ 15,000	\$ 285,000
1.2	Clearing the ROW - Light (mowing)	61.0	Acre		\$ -	\$ 5,000	\$ 305,000	\$ 5,000	\$ 305,000
1.3	Permanent Access Road	23,126	LF	\$ -	\$ -	\$ 45.00	\$ 1,040,688	\$ 45	\$ 1,040,688
1.4	Silt Fence	115,632	LF	\$ -	\$ -	\$ 4.00	\$ 462,528	\$ 4	\$ 462,528
1.5	Matting - Access and ROW	92,506	LF	\$ -	\$ -	\$ 70.00	\$ 6,475,392	\$ 70	\$ 6,475,392
1.6	Matting - To Work Area	12,900	LF	\$ -	\$ -	\$ 70.00	\$ 903,000	\$ 70	\$ 903,000
1.7	Snow Removal	21.9	Mile	\$ -	\$ -	\$ 16,000	\$ 350,400	\$ 16,000	\$ 350,400
1.8	ROW Restoration	21.9	Mile	\$ -	\$ -	\$ 10,000	\$ 219,000	\$ 10,000	\$ 219,000
1.9	Work Pads	860,000	SF	\$ -	\$ -	\$ 3.52	\$ 3,027,200	\$ 4	\$ 3,027,200
1.10	Restoration for Work Pad areas	172,000	SF	\$ -	\$ -	\$ 0.15	\$ 25,800	\$ 0.15	\$ 25,800
1.11	Temporary Access Bridge	9	EA	\$ -	\$ -	\$ 20,035	\$ 180,315	\$ 20,035	\$ 180,315
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	4	EA	\$ -	\$ -	\$ 4,580	\$ 18,320	\$ 4,580	\$ 18,320
1.14	Maintenance and Protection of Traffic on Public Roads	47	EA	\$ -	\$ -	\$ 4,130	\$ 194,110	\$ 4,130	\$ 194,110
1.15	Culverts / Misc. Access	10	EA	\$ 750	\$ 7,500	\$ 1,250	\$ 12,500	\$ 2,000	\$ 20,000
1.16	Gates	2	EA	\$ 2,000	\$ 4,000	\$ 2,500	\$ 5,000	\$ 4,500	\$ 9,000
1.17	Concrete Washout Station	2	EA	\$ -	\$ -	\$ 1,850	\$ 3,700	\$ 1,850	\$ 3,700
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 11,500		\$ 13,507,953		\$ 13,519,453
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345/115kV D/C Single Pole Delta V-String Tangent Steel 80'	158	EA	\$ 62,926	\$ 9,942,274	\$ 63,600	\$ 10,048,751	\$ 126,525	\$ 19,991,025
2.2	Drilled Pier - 345/115kV D/C Two-Pole Dead End Delta Steel (Dead End) 80'	8	EA	\$ 172,097	\$ 1,376,775	\$ 173,940	\$ 1,391,519	\$ 346,037	\$ 2,768,294
2.3	Drilled Pier - 345/115kV D/C Two-Pole Dead End Delta Steel (Storm Dead End) 80'	8	EA	\$ 172,097	\$ 1,376,775	\$ 173,940	\$ 1,391,519	\$ 346,037	\$ 2,768,294
2.4	Rock Excavation Adder	582.0	CY	\$ -	\$ -	\$ 2,000	\$ 1,164,000	\$ 2,000	\$ 1,164,000
2.5									
2.6									
2.7									
2.8									
2.9									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
2.10									
2.11									
2.12									
2.13									
2.14									
2.15									
2.16									
2.17									
2.18									
<b>TOTAL - FOUNDATIONS:</b>					\$ 12,695,824		\$ 13,995,790		\$ 26,691,613
<b>3. STRUCTURES</b>									
3.1	345/115kV D/C Single Pole Delta V-String Tangent Steel 80'	158	Structure	\$ 56,795	\$ 8,973,610	\$ 34,077	\$ 5,384,166	\$ 90,872	\$ 14,357,776
3.2	345/115kV D/C Two-Pole Dead End Delta Steel (Dead End) 80'	8	Structure	\$ 87,135	\$ 697,080	\$ 52,281	\$ 418,248	\$ 139,416	\$ 1,115,328
3.3	345/115kV D/C Two-Pole Dead End Delta Steel (Storm Dead End) 80'	6	Structure	\$ 87,135	\$ 522,810	\$ 52,281	\$ 313,686	\$ 139,416	\$ 836,496
3.4	Remove Existing Foundation	688	EA	\$ -	\$ -	\$ 3,250	\$ 2,236,000	\$ 3,250	\$ 2,236,000
3.5	Remove Existing Structure and Accessories	172	EA	\$ -	\$ -	\$ 12,500	\$ 2,150,000	\$ 12,500	\$ 2,150,000
3.6	Install Grounding and Grounding Accessories	186	Pole	\$ 506	\$ 94,116	\$ 5,539	\$ 1,030,161	\$ 6,045	\$ 1,124,277
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 10,287,616		\$ 11,532,261		\$ 21,819,877
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	728,482	LF	\$ 1.90	\$ 1,384,116	\$ 5.00	\$ 3,642,410	\$ 6.90	\$ 5,026,526
4.2	(1) OPGW 36 Fiber AC-33/38/571	121,414	LF	\$ 1.35	\$ 163,909	\$ 5.00	\$ 607,070	\$ 6.35	\$ 770,979
4.3	(1) 3/8" EHS7 Steel	121,414	LF	\$ 0.47	\$ 57,065	\$ 5.00	\$ 607,070	\$ 5.47	\$ 664,135
4.4	Remove Existing Cable From Existing Structures	43.8	Mile	\$ -	\$ -	\$ 30,000	\$ 1,314,000	\$ 30,000.00	\$ 1,314,000
4.5	Remove Existing OPGW Cable and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.6	Remove Existing OHSW and Accessories	21.9	Mile	\$ -	\$ -	\$ 12,000	\$ 262,800	\$ 12,000.00	\$ 262,800
4.7	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	364,241	LF	\$ 1.90	\$ 692,058	\$ 5.00	\$ 1,821,205	\$ 6.90	\$ 2,513,263
4.8	Rider Poles (47 Locations)	24	Set	\$ 1,750	\$ 42,000	\$ 3,500	\$ 84,000	\$ 5,250.00	\$ 126,000
4.9	Rider Poles - Relocated	23	Set	\$ -	\$ -	\$ 3,500	\$ 80,500	\$ 3,500.00	\$ 80,500
4.10									
4.11									
4.12									
4.13									
4.14									
4.15									
4.16									
4.17									
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 2,339,147		\$ 8,681,855		\$ 11,021,002
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Mono Pole Vertical Tangent - V-String (1-Group of 18-Bells Each Assembly)	948	Assembly	\$ 1,800	\$ 1,706,400	\$ 720	\$ 682,560	\$ 2,520	\$ 2,388,960
5.2	115kV Mono Pole Vertical Tangent - V-String (1-Group of 9-Bells Each Assembly)	948	Assembly	\$ 900	\$ 853,200	\$ 560	\$ 530,880	\$ 1,460	\$ 1,384,080
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	168	Assembly	\$ 1,800	\$ 302,400	\$ 720	\$ 120,960	\$ 2,520	\$ 423,360
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	84	Assembly	\$ 900	\$ 75,600	\$ 560	\$ 47,040	\$ 1,460	\$ 122,640
5.5					\$ -		\$ -	\$ -	\$ -
5.6			Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
5.7			Assembly	\$ 3,600	\$ -	\$ 1,440	\$ -	\$ 5,040	\$ -
5.8	OPGW Assembly - Tangent	158	Assembly	\$ 200	\$ 31,600	\$ 150	\$ 23,700	\$ 350	\$ 55,300
5.9	OPGW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.10	OHSW Assembly - Tangent	158	Assembly	\$ 200	\$ 31,600	\$ 150	\$ 23,700	\$ 350	\$ 55,300
5.11	OHSW Assembly - Angle / DE	28	Assembly	\$ 250	\$ 7,000	\$ 150	\$ 4,200	\$ 400	\$ 11,200
5.12	OPGW Splice Boxes	8	Set	\$ 1,746	\$ 13,969	\$ 2,274	\$ 18,192	\$ 4,020	\$ 32,161
5.13	OPGW Splice & Test	8	EA	\$ 2,520	\$ 20,160	\$ 2,520	\$ 20,160	\$ 5,040	\$ 40,320
5.14	Spacer - Conductor	3,642	EA	\$ 50	\$ 182,100	\$ 35	\$ 127,470	\$ 85	\$ 309,570
5.15	Vibration Dampers - Conductor	1,311	EA	\$ 35	\$ 45,885	\$ 35	\$ 45,885	\$ 70	\$ 91,770
5.16	Shield wire / OPGW Dampers, Misc. Fittings	442	EA	\$ 27	\$ 11,934	\$ 35	\$ 15,470	\$ 62	\$ 27,404
5.17									
5.18									
5.19									
5.20									
5.21	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.22	Misc. materials (Signs and Markers)	21.9	Mile	\$ 770	\$ 16,863	\$ 1,006	\$ 22,031	\$ 1,776	\$ 38,894
5.23		-		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 3,305,711		\$ 1,686,448		\$ 4,992,160
<b>A. Transmission Line Knickerbocker to Churchtown</b>					\$ 28,639,798		\$ 49,404,307		\$ 78,044,105
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 780,441	\$ 780,441	\$ 780,441	\$ 780,441
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 3,755,170	\$ 3,755,170	\$ 3,755,170	\$ 3,755,170
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 780,441	\$ 780,441	\$ 780,441	\$ 780,441
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 780,441	\$ 780,441	\$ 780,441	\$ 780,441
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 3,902,205	\$ 3,902,205	\$ 3,902,205	\$ 3,902,205
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 234,132	\$ 234,132	\$ 234,132	\$ 234,132
6.7	Geotech	22	Location	\$ -	\$ -	\$ 3,500	\$ 77,000	\$ 3,500	\$ 77,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 546,309	\$ 546,309	\$ 546,309	\$ 546,309
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 234,132	\$ 234,132	\$ 234,132	\$ 234,132
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 3,186,000	\$ 3,186,000	\$ 3,186,000	\$ 3,186,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 2,291,184	\$ 2,291,184	\$ -	\$ -	\$ 2,291,184	\$ 2,291,184
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 78,044	\$ 78,044	\$ 78,044	\$ 78,044
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 2,291,184		\$ 14,394,316		\$ 16,685,500

**ITC T032 (Segment B)**

**B. Transmission Line Churchtown to Pleasant Valley**

Estimate Revision: 8

Total: \$ 182,797,981

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>B. Transmission Line Churchtown to Pleasant Valley</b>			
1. CLEARING & ACCESS	\$ 14,000	\$ 20,315,402	\$ 20,329,402
2. FOUNDATIONS	\$ 21,569,255	\$ 33,464,251	\$ 55,033,507
3. STRUCTURES	\$ 17,229,070	\$ 26,612,906	\$ 43,841,976
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 4,553,240	\$ 17,722,775	\$ 22,276,015
5. INSULATORS, FITTINGS, HARDWARE	\$ 7,182,734	\$ 3,815,288	\$ 10,998,023
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 4,043,864	\$ 26,275,194	\$ 30,319,058
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 54,592,164</b>	<b>\$ 128,205,817</b>	<b>\$ 182,797,981</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 54,592,164</b>	<b>\$ 128,205,817</b>	<b>\$ 182,797,981</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Churchtown to Pleasant Valley</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	91.0	Acre	\$ -	\$ -	\$ 5,000	\$ 455,000	\$ 5,000	\$ 455,000
1.3	Permanent Access Road	33,897.6	LF	\$ -	\$ -	\$ 45	\$ 1,525,392	\$ 45	\$ 1,525,392
1.4	Silt Fence	169,488.0	LF	\$ -	\$ -	\$ 4	\$ 677,952	\$ 4	\$ 677,952
1.5	Matting - Access and ROW	135,590.4	LF	\$ -	\$ -	\$ 70	\$ 9,491,328	\$ 70	\$ 9,491,328
1.6	Matting - To Work Area	18,750.0	LF	\$ -	\$ -	\$ 70	\$ 1,312,500	\$ 70	\$ 1,312,500
1.7	Snow Removal	32.1	Mile	\$ -	\$ -	\$ 16,000	\$ 513,600	\$ 16,000	\$ 513,600
1.8	ROW Restoration	32.1	Mile	\$ -	\$ -	\$ 10,000	\$ 321,000	\$ 10,000	\$ 321,000
1.9	Work Pads	1,490,000.0	SF	\$ -	\$ -	\$ 4	\$ 5,244,800	\$ 4	\$ 5,244,800
1.10	Restoration for Work Pad areas	298,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 44,700	\$ 0	\$ 44,700
1.11	Temporary Access Bridge	14	EA	\$ -	\$ -	\$ 20,035	\$ 280,490	\$ 20,035	\$ 280,490
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	12	EA	\$ -	\$ -	\$ 4,580	\$ 54,960	\$ 4,580	\$ 54,960
1.14	Maintenance and Protection of Traffic on Public Roads	86	EA	\$ -	\$ -	\$ 4,130	\$ 355,180	\$ 4,130	\$ 355,180
1.15	Gates	4	EA	\$ 2,000	\$ 8,000	\$ 2,500	\$ 10,000	\$ 4,500	\$ 18,000
1.16	Culverts / Misc. Access	8	EA	\$ 750	\$ 6,000	\$ 1,250	\$ 10,000	\$ 2,000	\$ 16,000
1.17	Concrete Washout Station	10	EA	\$ -	\$ -	\$ 1,850	\$ 18,500	\$ 1,850	\$ 18,500
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ 14,000		\$ 20,315,402		\$ 20,329,402
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 345/115kV Triple Circuit Two-Pole V-String Frame Tangent Steel 85'	279	EA	\$ 59,729	\$ 16,664,495	\$ 60,369	\$ 16,842,964	\$ 120,098	\$ 33,507,459
2.2	Drilled Pier - 345/115kV Triple Circuit Three-Pole Dead End Delta Steel (Dead End) 85'	12	EA	\$ 258,145	\$ 3,097,743	\$ 260,910	\$ 3,130,919	\$ 519,055	\$ 6,228,662
2.3	Drilled Pier - 345/115kV Triple Circuit Three-Pole Dead End Delta Steel (Storm Dead End) 85'	7	EA	\$ 258,145	\$ 1,807,017	\$ 260,910	\$ 1,826,369	\$ 519,055	\$ 3,633,386
2.4									
2.5	Rock Excavation Adder	5,832.0	CY	\$ -	\$ -	\$ 2,000	\$ 11,664,000	\$ 2,000	\$ 11,664,000
2.6									
2.7									
2.8									
2.9									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.10									
2.11									
2.12									
<b>TOTAL - FOUNDATIONS:</b>					\$ 21,569,255		\$ 33,464,251		\$ 55,033,507
<b>3. STRUCTURES</b>									
3.1	345/115kV Triple Circuit Two-Pole V-String Frame Tangent Steel 85'	279	Structure	\$ 53,280	\$ 14,865,120	\$ 31,968	\$ 8,919,072	\$ 85,248	\$ 23,784,192
3.2	345/115kV Triple Circuit Three-Pole Dead End Delta Steel (Dead End) 85'	12	Structure	\$ 108,040	\$ 1,296,480	\$ 64,824	\$ 777,888	\$ 172,864	\$ 2,074,368
3.3	345/115kV Triple Circuit Three-Pole Dead End Delta Steel (Storm Dead End) 85'	7	Structure	\$ 108,040	\$ 756,280	\$ 64,824	\$ 453,768	\$ 172,864	\$ 1,210,048
3.4	Remove Existing Foundation	2,048	EA	\$ -	\$ -	\$ 3,250	\$ 6,656,000	\$ 3,250	\$ 6,656,000
3.5	Remove Existing Structure and Accessories	512	EA	\$ -	\$ -	\$ 12,500	\$ 6,400,000	\$ 12,500	\$ 6,400,000
3.6	Install Grounding and Grounding Accessories	615	Pole	\$ 506	\$ 311,190	\$ 5,539	\$ 3,406,178	\$ 6,045	\$ 3,717,368
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
3.16									
3.17									
<b>TOTAL - STRUCTURES PRINCETOWN TO NEW SCOTLAND:</b>					\$ 17,229,070		\$ 26,612,906		\$ 43,841,976
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	1,094,386	LF	\$ 1.90	\$ 2,079,333	\$ 5.00	\$ 5,471,930	\$ 6.90	\$ 7,551,263
4.2	(1) OPGW 36 Fiber AC-33/38/571	182,398	LF	\$ 1.35	\$ 246,237	\$ 5.00	\$ 911,990	\$ 6.35	\$ 1,158,227
4.3	(1) 3/8" EHS7 Steel	182,398	LF	\$ 0.47	\$ 85,727	\$ 5.00	\$ 911,990	\$ 5.47	\$ 997,717
4.5	Remove Existing 115kV Cable From Existing Structures	130.4	Mile	\$ -	\$ -	\$ 30,000	\$ 3,912,000	\$ 30,000.00	\$ 3,912,000
4.6	Remove Existing OPGW Cable and Accessories	32.3	Mile	\$ -	\$ -	\$ 12,000	\$ 387,600	\$ 12,000.00	\$ 387,600
4.7	Remove Existing OHSW and Accessories	32.3	Mile	\$ -	\$ -	\$ 12,000	\$ 387,600	\$ 12,000.00	\$ 387,600
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	1,087,733	LF	\$ 1.90	\$ 2,066,693	\$ 5.00	\$ 5,438,665	\$ 6.90	\$ 7,505,358
4.9									
4.10	Rider Poles - Relocated	43	Set	\$ -	\$ -	\$ 3,500	\$ 150,500	\$ 3,500.00	\$ 150,500
4.11	Rider Poles (86 Total)	43	EA	\$ 1,750	\$ 75,250	\$ 3,500	\$ 150,500	\$ 5,250.00	\$ 225,750
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 4,553,240		\$ 17,722,775		\$ 22,276,015
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Mono Pole Vertical Tangent - V-String (1-Group of 18-Bells Each Assembly)	1,674	Assembly	\$ 1,800	\$ 3,013,200	\$ 720	\$ 1,205,280	\$ 2,520	\$ 4,218,480
5.2	115kV Mono Pole Vertical Tangent - V-String (1-Group of 9-Bells Each Assembly)	3,348	Assembly	\$ 900	\$ 3,013,200	\$ 560	\$ 1,874,880	\$ 1,460	\$ 4,888,080
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	228	Assembly	\$ 1,800	\$ 410,400	\$ 720	\$ 164,160	\$ 2,520	\$ 574,560
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	228	Assembly	\$ 900	\$ 205,200	\$ 560	\$ 127,680	\$ 1,460	\$ 332,880
5.5	OPGW Assembly - Tangent	279	Assembly	\$ 200	\$ 55,800	\$ 150	\$ 41,850	\$ 350	\$ 97,650
5.6	OPGW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.7	OHSW Assembly - Tangent	279	Assembly	\$ 200	\$ 55,800	\$ 150	\$ 41,850	\$ 350	\$ 97,650
5.8	OHSW Assembly - Angle / DE	38	Assembly	\$ 250	\$ 9,500	\$ 150	\$ 5,700	\$ 400	\$ 15,200
5.9	OPGW Splice Boxes	12	Set	\$ 1,746	\$ 20,954	\$ 2,274	\$ 27,288	\$ 4,020	\$ 48,242
5.10	OPGW Splice & Test	12	EA	\$ 2,520	\$ 30,240	\$ 2,520	\$ 30,240	\$ 5,040	\$ 60,480
5.11	Spacer - Conductor	5,414	EA	\$ 50	\$ 270,700	\$ 35	\$ 189,490	\$ 85	\$ 460,190
5.12	Vibration Dampers - Conductor	1,299	EA	\$ 35	\$ 45,465	\$ 35	\$ 45,465	\$ 70	\$ 90,930
5.13	Shieldwire / OPGW Dampers, Misc. Fittings	656	EA	\$ 27	\$ 17,712	\$ 35	\$ 22,960	\$ 62	\$ 40,672
5.14	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.15	Misc. materials (Signs and Markers)	32.6	Mile	\$ 770	\$ 25,064	\$ 1,006	\$ 32,745	\$ 1,776	\$ 57,809
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 7,182,734		\$ 3,815,288		\$ 10,998,023

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>B. Transmission Line Churchtown to Pleasant Valley</b>					\$ 50,548,300		\$ 101,930,622		\$ 152,478,922
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 1,524,789	\$ 1,524,789	\$ 1,524,789	\$ 1,524,789
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 7,336,676	\$ 7,336,676	\$ 7,336,676	\$ 7,336,676
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 1,524,789	\$ 1,524,789	\$ 1,524,789	\$ 1,524,789
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 1,524,789	\$ 1,524,789	\$ 1,524,789	\$ 1,524,789
<b>Engineering</b>									
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 7,623,946	\$ 7,623,946	\$ 7,623,946	\$ 7,623,946
6.6	LIDAR	1	LS	\$ -	\$ -	\$ 457,437	\$ 457,437	\$ 457,437	\$ 457,437
6.7	Geotech	33	Location	\$ -	\$ -	\$ 3,500	\$ 115,500	\$ 3,500	\$ 115,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 1,067,352	\$ 1,067,352	\$ 1,067,352	\$ 1,067,352
<b>Testing &amp; Commissioning</b>									
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
<b>Permitting and Additional Costs</b>									
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 457,437	\$ 457,437	\$ 457,437	\$ 457,437
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 4,450,000	\$ 4,450,000	\$ 4,450,000	\$ 4,450,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 4,043,864	\$ 4,043,864	\$ -	\$ -	\$ 4,043,864	\$ 4,043,864
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 152,479	\$ 152,479	\$ 152,479	\$ 152,479
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 4,043,864		\$ 26,275,194		\$ 30,319,058

**ITC T032 (Segment B)**

**C. Blue Stores Junction to Blue Stores Substation**

Estimate Revision: **8**

Total: \$ **5,682,945**

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>C. Blue Stores Junction to Blue Stores Substation</b>			
1. CLEARING & ACCESS	\$ -	\$ 1,404,512	\$ 1,404,512
2. FOUNDATIONS	\$ 236,848	\$ 925,954	\$ 1,162,802
3. STRUCTURES	\$ 596,484	\$ 946,665	\$ 1,543,149
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ 84,763	\$ 387,095	\$ 471,858
5. INSULATORS, FITTINGS, HARDWARE	\$ 107,544	\$ 56,496	\$ 164,040
6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 82,051	\$ 854,534	\$ 936,585
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,107,690</b>	<b>\$ 4,575,256</b>	<b>\$ 5,682,945</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,107,690</b>	<b>\$ 4,575,256</b>	<b>\$ 5,682,945</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>C. Blue Stores Junction to Blue Stores Substation</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	4.0	Acre	\$ -	\$ -	\$ 5,000	\$ 20,000	\$ 5,000	\$ 20,000
1.3	Permanent Access Road	2,218	LF	\$ -	\$ -	\$ 45	\$ 99,792	\$ 45	\$ 99,792
1.4	Silt Fence	11,088.0	LF	\$ -	\$ -	\$ 4	\$ 44,352	\$ 4	\$ 44,352
1.5	Matting - Access and ROW	8,870	LF	\$ -	\$ -	\$ 70	\$ 620,928	\$ 70	\$ 620,928
1.6	Matting - To Work Area	1,800.0	LF	\$ -	\$ -	\$ 70	\$ 126,000	\$ 70	\$ 126,000
1.7	Snow Removal	2.1	Mile	\$ -	\$ -	\$ 16,000	\$ 33,600	\$ 16,000	\$ 33,600
1.8	ROW Restoration	2.1	Mile	\$ -	\$ -	\$ 10,000	\$ 21,000	\$ 10,000	\$ 21,000
1.9	Work Pads	120,000.0	SF	\$ -	\$ -	\$ 4	\$ 422,400	\$ 4	\$ 422,400
1.10	Restoration for Work Pad areas	24,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 3,600	\$ 0	\$ 3,600
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	1	EA	\$ -	\$ -	\$ 4,580	\$ 4,580	\$ 4,580	\$ 4,580
1.14	Maintenance and Protection of Traffic on Public Roads	2	EA	\$ -	\$ -	\$ 4,130	\$ 8,260	\$ 4,130	\$ 8,260
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ -	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	-	EA	\$ -	\$ -	\$ 1,850	\$ -	\$ 1,850	\$ -
<b>TOTAL - CLEARING &amp; ACCESS:</b>					\$ -	\$ -	\$ 1,404,512	\$ -	\$ 1,404,512
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	6	EA	\$ 31,225	\$ 187,348	\$ 31,559	\$ 189,354	\$ 62,784	\$ 376,702
2.2	Direct Embed - 115kV Single Circuit H- Pole Tangent	18	EA	\$ 2,750	\$ 49,500	\$ 18,700	\$ 336,600	\$ 21,450	\$ 386,100
2.3	Rock Excavation Adder	200.0	CY	\$ -	\$ -	\$ 2,000	\$ 400,000	\$ 2,000	\$ 400,000
2.4									
2.5									
2.6									
2.7									
2.8									
2.9									
2.10									
2.11									
2.12									
2.13									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.14									
2.15									
<b>TOTAL - FOUNDATIONS:</b>					\$ 236,848		\$ 925,954		\$ 1,162,802
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit H- Pole Angle/ DE	6	Structure	\$ 39,822	\$ 238,929	\$ 23,893	\$ 143,358	\$ 63,714	\$ 382,287
3.2	115kV Single Circuit H- Pole Tangent	18	Structure	\$ 18,515	\$ 333,266	\$ 11,109	\$ 199,960	\$ 29,624	\$ 533,226
3.3	Remove Existing Foundation	-	EA	\$ -	\$ -	\$ 7,500	\$ -	\$ 7,500	\$ -
3.4	Remove Existing Structure and Accessories	27	EA	\$ -	\$ -	\$ 12,500	\$ 337,500	\$ 12,500	\$ 337,500
3.5									
3.6	Install Grounding and Grounding Accessories	48	Pole	\$ 506	\$ 24,288	\$ 5,539	\$ 265,848	\$ 6,045	\$ 290,136
3.7									
3.8									
3.9									
3.10									
3.11									
3.12									
3.13									
3.14									
3.15									
<b>TOTAL - STRUCTURES:</b>					\$ 596,484		\$ 946,665		\$ 1,543,149
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ -	\$ -	\$ 5.00	\$ -	\$ 5.00	\$ -
4.4	115kV - (1) 795kcmil 26/7 ACSR "Drake"	34,927.0	LF	\$ 1.72	\$ 60,074	\$ 5.00	\$ 174,635	\$ 6.72	\$ 234,709
4.5	(1) OPGW 36 Fiber AC-33/38/571	11,642.0	LF	\$ 1.35	\$ 15,717	\$ 5.00	\$ 58,210	\$ 6.35	\$ 73,927
4.6	(1) 3/8" EHS7 Steel	11,642.0	LF	\$ 0.47	\$ 5,472	\$ 5.00	\$ 58,210	\$ 5.47	\$ 63,682
4.7	Remove Existing Cable	2.1	Mile	\$ -	\$ -	\$ 30,000	\$ 63,600	\$ 30,000.00	\$ 63,600
4.8	Remove Existing OPGW Cable and Accessories	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.9	Remove Existing OHSW and Accessories	2.1	Mile	\$ -	\$ -	\$ 12,000	\$ 25,440	\$ 12,000.00	\$ 25,440
4.10		-							
4.11		-							
4.12	Rider Poles (Locations)	2.0	EA	\$ 1,750	\$ 3,500	\$ 3,500	\$ 7,000	\$ 5,250.00	\$ 10,500
4.13									
<b>TOTAL - CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ 84,763		\$ 387,095		\$ 471,858
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Mono Pole Vertical Tangent - V-String (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Mono Pole Vertical Tangent - V-String (1-Group of 9-Bells Each Assembly)	54	Assembly	\$ 900	\$ 48,600	\$ 360	\$ 19,440	\$ 1,260	\$ 68,040
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	36	Assembly	\$ 900	\$ 32,400	\$ 360	\$ 12,960	\$ 1,260	\$ 45,360
5.5			Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.7	OPGW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.8	OHSW Assembly - Tangent	18	Assembly	\$ 200	\$ 3,600	\$ 150	\$ 2,700	\$ 350	\$ 6,300
5.9	OHSW Assembly - Angle / DE	12	Assembly	\$ 250	\$ 3,000	\$ 150	\$ 1,800	\$ 400	\$ 4,800
5.10	OPGW Splice Boxes	2	Set	\$ 1,746	\$ 3,492	\$ 2,274	\$ 4,548	\$ 4,020	\$ 8,040
5.11	OPGW Splice & Test	2	EA	\$ 2,520	\$ 5,040	\$ 2,520	\$ 5,040	\$ 5,040	\$ 10,080
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	72	EA	\$ 35	\$ 2,520	\$ 35	\$ 2,520	\$ 70	\$ 5,040
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	25	EA	\$ 27	\$ 675	\$ 35	\$ 875	\$ 62	\$ 1,550
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	2.1	Mile	\$ 770	\$ 1,617	\$ 1,006	\$ 2,113	\$ 1,776	\$ 3,730
5.17									
<b>TOTAL - INSULATORS, FITTINGS, HARDWARE:</b>					\$ 107,544		\$ 56,496		\$ 164,040
<b>C. Blue Stores Junction to Blue Stores Substation</b>					\$ 1,025,639		\$ 3,720,722		\$ 4,746,361
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
Contractor Mobilization / Demobilization									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 228,376	\$ 228,376	\$ 228,376	\$ 228,376
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 47,464	\$ 47,464	\$ 47,464	\$ 47,464
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 237,318	\$ 237,318	\$ 237,318	\$ 237,318
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.7	Geotech	2	Location	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 33,225	\$ 33,225	\$ 33,225	\$ 33,225
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 14,239	\$ 14,239	\$ 14,239	\$ 14,239
6.13	Real Estate Costs (New ROW)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Real Estate Costs (Incumbent Utility ROW)	1	LS	\$ -	\$ -	\$ 153,000	\$ 153,000	\$ 153,000	\$ 153,000
6.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.18	Sales Tax on Materials	1	LS	\$ 82,051	\$ 82,051	\$ -	\$ -	\$ 82,051	\$ 82,051
6.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 4,746	\$ 4,746	\$ 4,746	\$ 4,746
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 82,051	\$	\$ 854,534	\$	\$ 936,585

**ITC T032 (Segment B)**

**D. Knickerbocker 345kV Substation - Install**

Estimate Revision: **8** Total: \$ **26,378,891**

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>D. Knickerbocker 345kV Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 307,450	\$ 3,237,850	\$ 3,545,300
2. SUBSTATION FOUNDATIONS	\$ 1,648,569	\$ 1,775,150	\$ 3,423,719
3. SUBSTATION STRUCTURES	\$ 846,190	\$ 846,190	\$ 1,692,380
4. MAJOR EQUIPMENT	\$ 756,000	\$ 420,000	\$ 1,176,000
5. SMALL EQUIPMENT / MATERIALS	\$ 1,802,280	\$ 973,500	\$ 2,775,780
6. CONTROL HOUSE / PANELS	\$ 2,534,025	\$ 1,641,025	\$ 4,175,050
7. MISC ITEMS	\$ 1,537,224	\$ 2,786,694	\$ 4,323,918
8. MOB/DEMOb, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 754,539	\$ 4,512,205	\$ 5,266,744
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 10,186,277</b>	<b>\$ 16,192,614</b>	<b>\$ 26,378,891</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 10,186,277</b>	<b>\$ 16,192,614</b>	<b>\$ 26,378,891</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>D. Knickerbocker 345kV Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	7.4	ACRES	\$ -	\$ -	\$ 355,000	\$ 2,627,000	\$ 355,000	\$ 2,627,000
1.2	Station stone within substation fence.	2,400	CY	\$ 27	\$ 64,800	\$ 75	\$ 180,000	\$ 102	\$ 244,800
1.3	Substation Fence	2,200	LF	\$ 100	\$ 220,000	\$ 100	\$ 220,000	\$ 200	\$ 440,000
1.4									
1.5									
1.6	Permanent Access Road - 20'-Wide	490	LF	\$ 35	\$ 17,150	\$ 285	\$ 139,650	\$ 320	\$ 156,800
1.7	Pavement	0	SY	\$ -	\$ -	\$ 55	\$ -	\$ 55	\$ -
1.8	Gates	2	EA	\$ 2,000	\$ 4,000	\$ 2,500	\$ 5,000	\$ 4,500	\$ 9,000
1.9	Culverts / Misc. Access	2	EA	\$ 750	\$ 1,500	\$ 1,250	\$ 2,500	\$ 2,000	\$ 4,000
1.10	Concrete Washout Station	2	EA	\$ -	\$ -	\$ 1,850	\$ 3,700	\$ 1,850	\$ 3,700
1.11	Remove Existing Concrete Foundation	3	EA	\$ -	\$ -	\$ 7,500	\$ 22,500	\$ 7,500	\$ 22,500
1.12	Remove Existing 3-Pole Structure	3	EA	\$ -	\$ -	\$ 12,500	\$ 37,500	\$ 12,500	\$ 37,500
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 307,450		\$ 3,237,850		\$ 3,545,300
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	3	EA	\$ 14,940	\$ 44,820	\$ 16,000	\$ 48,000	\$ 30,940	\$ 92,820
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	12	EA	\$ 26,145	\$ 313,740	\$ 28,000	\$ 336,000	\$ 54,145	\$ 649,740
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	36	EA	\$ 4,482	\$ 161,352	\$ 4,800	\$ 172,800	\$ 9,282	\$ 334,152
2.1f	Station Service Transformer Stand Foundation	4	EA	\$ 4,482	\$ 17,928	\$ 4,800	\$ 19,200	\$ 9,282	\$ 37,128
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	66	EA	\$ 4,482	\$ 295,812	\$ 4,800	\$ 316,800	\$ 9,282	\$ 612,612
2.1j	Instrument Transformer Stand Foundations	27	EA	\$ 4,482	\$ 121,014	\$ 4,800	\$ 129,600	\$ 9,282	\$ 250,614
2.1k	Arrester Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1m	Wave Trap Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1n	Station Service Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p	Reactor Foundations	0	EA	\$ 7,470	\$ -	\$ 8,000	\$ -	\$ 15,470	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.1q									
<b>2.2</b>	<b>230kV</b>								
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Fuse Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	3	EA	\$ 5,229	\$ 15,687	\$ 5,600	\$ 16,800	\$ 10,829	\$ 32,487
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	12	EA	\$ 16,434	\$ 197,208	\$ 17,600	\$ 211,200	\$ 34,034	\$ 408,408
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	14	EA	\$ 2,988	\$ 41,832	\$ 3,200	\$ 44,800	\$ 6,188	\$ 86,632
2.3f	Fuse Stand Foundations	2	EA	\$ 2,988	\$ 5,976	\$ 3,200	\$ 6,400	\$ 6,188	\$ 12,376
2.3g	Bus Support 3ph Foundations	30	EA	\$ 2,988	\$ 89,640	\$ 3,200	\$ 96,000	\$ 6,188	\$ 185,640
2.3h	Bus Support 1 Ph Foundations	15	EA	\$ 2,988	\$ 44,820	\$ 3,200	\$ 48,000	\$ 6,188	\$ 92,820
2.3j	Instrument Transformer Stand Foundations	27	EA	\$ 2,988	\$ 80,676	\$ 3,200	\$ 86,400	\$ 6,188	\$ 167,076
2.3k	Arrester Stand Foundations	9	EA	\$ 2,988	\$ 26,892	\$ 3,200	\$ 28,800	\$ 6,188	\$ 55,692
2.3m	Wave Trap Stand Foundations	3	EA	\$ 2,988	\$ 8,964	\$ 3,200	\$ 9,600	\$ 6,188	\$ 18,564
2.3n	Station Service Foundations	1	EA	\$ 1,121	\$ 1,121	\$ 1,200	\$ 1,200	\$ 2,321	\$ 2,321
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 48,555	\$ 48,555	\$ 52,000	\$ 52,000	\$ 100,555	\$ 100,555
2.5b	Generator Foundation	1	EA	\$ 16,000	\$ 16,000	\$ 17,000	\$ 17,000	\$ 33,000	\$ 33,000
2.5c	Station Service Distribution Line - 3ph.	1	LS	\$ -	\$ -	\$ 9,750	\$ 9,750	\$ 9,750	\$ 9,750
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	12	EA	\$ 5,229	\$ 62,748	\$ 5,600	\$ 67,200	\$ 10,829	\$ 129,948
2.6b				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 1,648,569		\$ 1,775,150		\$ 3,423,719
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	3	EA	\$ 37,000	\$ 111,000	\$ 37,000	\$ 111,000	\$ 74,000	\$ 222,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	6	EA	\$ 14,800	\$ 88,800	\$ 14,800	\$ 88,800	\$ 29,600	\$ 177,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	66	EA	\$ 3,700	\$ 244,200	\$ 3,700	\$ 244,200	\$ 7,400	\$ 488,400
3.1g	Instrument Transformer Stand	27	EA	\$ 1,850	\$ 49,950	\$ 1,850	\$ 49,950	\$ 3,700	\$ 99,900
3.1h	Arrester Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1j	Wave Trap Stand	3	EA	\$ 7,400	\$ 22,200	\$ 7,400	\$ 22,200	\$ 14,800	\$ 44,400
3.1k	Lightning Mast - 70'	6	EA	\$ 6,475	\$ 38,850	\$ 6,475	\$ 38,850	\$ 12,950	\$ 77,700
<b>3.2 230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3 115kV</b>									
3.3a	Substation A-Frame Structures - Stand alone	3	EA	\$ 18,500	\$ 55,500	\$ 18,500	\$ 55,500	\$ 37,000	\$ 111,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	7	EA	\$ 7,955	\$ 55,685	\$ 7,955	\$ 55,685	\$ 15,910	\$ 111,370
3.3d	Fuse Stand	1	EA	\$ 7,955	\$ 7,955	\$ 7,955	\$ 7,955	\$ 15,910	\$ 15,910
3.3e	Bus Support 3ph	15	EA	\$ 3,330	\$ 49,950	\$ 3,330	\$ 49,950	\$ 6,660	\$ 99,900
3.3f	Bus Support 1 Ph	15	EA	\$ 1,850	\$ 27,750	\$ 1,850	\$ 27,750	\$ 3,700	\$ 55,500
3.3g	Instrument Transformer Stand	27	EA	\$ 740	\$ 19,980	\$ 740	\$ 19,980	\$ 1,480	\$ 39,960
3.3h	Arrester Stand	9	EA	\$ 740	\$ 6,660	\$ 740	\$ 6,660	\$ 1,480	\$ 13,320
3.3j	Wave Trap Stand	3	EA	\$ 3,700	\$ 11,100	\$ 3,700	\$ 11,100	\$ 7,400	\$ 22,200
3.3k	Lightning Mast - 70'	6	EA	\$ 6,475	\$ 38,850	\$ 6,475	\$ 38,850	\$ 12,950	\$ 77,700
3.3l	Station Service Transformer Support Stand	1	EA	\$ 1,110	\$ 1,110	\$ 1,110	\$ 1,110	\$ 2,220	\$ 2,220
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 846,190		\$ 846,190		\$ 1,692,380
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1 345kV</b>									
4.1a	Circuit Breakers	3	EA	\$ 200,000	\$ 600,000	\$ 80,000	\$ 240,000	\$ 280,000	\$ 840,000
4.1b	Capacitor Banks with Reactors	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c									
4.1d									
4.1e									
<b>4.2 230kV</b>									
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3 115kV</b>									
4.3a	Circuit Breakers	3	EA	\$ 52,000	\$ 156,000	\$ 60,000	\$ 180,000	\$ 112,000	\$ 336,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 756,000		\$ 420,000		\$ 1,176,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	3	EA	\$ 40,000	\$ 120,000	\$ 15,000	\$ 45,000	\$ 55,000	\$ 165,000
5.1b	Disconnect Switches - 3ph w/ manual operator	6	EA	\$ 35,000	\$ 210,000	\$ 17,500	\$ 105,000	\$ 52,500	\$ 315,000
5.1c	VT'S	9	EA	\$ 25,000	\$ 225,000	\$ 12,000	\$ 108,000	\$ 37,000	\$ 333,000
5.1d	CT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1e	CCVT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.1f	Arresters	9	EA	\$ 6,500	\$ 58,500	\$ 1,500	\$ 13,500	\$ 8,000	\$ 72,000
5.1g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	3	EA	\$ 33,000	\$ 99,000	\$ 15,000	\$ 45,000	\$ 48,000	\$ 144,000
5.3b	Disconnect Switches - 3ph w/ manual operator	7	EA	\$ 28,000	\$ 196,000	\$ 17,500	\$ 122,500	\$ 45,500	\$ 318,500
5.3c	VT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.3d	CT'S	9	EA	\$ 13,000	\$ 117,000	\$ 8,000	\$ 72,000	\$ 21,000	\$ 189,000
5.3e	CCVT'S	9	EA	\$ 8,000	\$ 72,000	\$ 8,000	\$ 72,000	\$ 16,000	\$ 144,000
5.3f	Arresters	9	EA	\$ 3,420	\$ 30,780	\$ 6,000	\$ 54,000	\$ 9,420	\$ 84,780
5.3g	Wave Traps	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.3h	Station Service Transformers	1	EA	\$ 200,000	\$ 200,000	\$ 50,000	\$ 50,000	\$ 250,000	\$ 250,000
5.3j	Fuses	3	EA	\$ 15,000	\$ 45,000	\$ 7,500	\$ 22,500	\$ 22,500	\$ 67,500
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 1,802,280		\$ 973,500		\$ 2,775,780
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 468,000	\$ 468,000	\$ 95,000	\$ 95,000	\$ 563,000	\$ 563,000
6.2	Protection and Telecom Equipment Panels	26	EA	\$ 35,000	\$ 910,000	\$ 10,000	\$ 260,000	\$ 45,000	\$ 1,170,000
6.3	125VDC Batteries	2	EA	\$ 75,000	\$ 150,000	\$ 25,000	\$ 50,000	\$ 100,000	\$ 200,000
6.4	Control Cables	1	LS	\$ 641,025	\$ 641,025	\$ 641,025	\$ 641,025	\$ 1,282,050	\$ 1,282,050
6.5	SCADA and Communications	1	EA	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ 150,000	\$ 150,000
6.6	Low Voltage AC Distribution	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.7	DC Distribution System	2	EA	\$ 50,000	\$ 100,000	\$ 100,000	\$ 200,000	\$ 150,000	\$ 300,000
6.8	Security	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.9	Fire Alarm	1	EA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500	\$ 15,000	\$ 15,000
6.10	Generator	1	EA	\$ 100,000	\$ 100,000	\$ 80,000	\$ 80,000	\$ 180,000	\$ 180,000
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 2,534,025		\$ 1,641,025		\$ 4,175,050

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	1,540.0	LF	\$ 185.00	\$ 284,900	\$ 170.00	\$ 261,800	\$ 355	\$ 546,700
7.2	Rigid Bus, Fittings & Insulators	5,000.0	LF	\$ 125.07	\$ 625,350	\$ 237.10	\$ 1,185,500	\$ 362	\$ 1,810,850
7.3	Strain Bus, Connectors & Insulators	0.0	LF	\$ 39.30	\$ -	\$ 53.35	\$ -	\$ 93	\$ -
7.4	Grounding System	26,800.0	LF	\$ 6.93	\$ 185,724	\$ 32.58	\$ 873,144	\$ 40	\$ 1,058,868
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	1	LS	\$ 50,000	\$ 50,000	\$ 75,000	\$ 75,000	\$ 125,000	\$ 125,000
7.9	SSVT Service	1	LS	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 90,000	\$ 90,000
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 166,250	\$ 166,250	\$ 166,250	\$ 166,250	\$ 332,500	\$ 332,500
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 1,537,224		\$ 2,786,694		\$ 4,323,918
<b>D. Knickerbocker 345kV Substation - Install</b>					\$ 9,431,738		\$ 11,680,409		\$ 21,112,147
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1.0	LS	\$ -	\$ -	\$ 211,121	\$ 211,121	\$ 211,121	\$ 211,121
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 1,015,832	\$ 1,015,832	\$ 1,015,832	\$ 1,015,832
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 211,121	\$ 211,121	\$ 211,121	\$ 211,121
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 211,121	\$ 211,121	\$ 211,121	\$ 211,121
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 1,688,972	\$ 1,688,972	\$ 1,688,972	\$ 1,688,972
8.6	LIDAR	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	EA	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 147,785	\$ 147,785	\$ 147,785	\$ 147,785
<b>Testing &amp; Commissioning</b>									
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 527,804	\$ 527,804	\$ 527,804	\$ 527,804
<b>Permitting and Additional Costs</b>									
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 63,336	\$ 63,336	\$ 63,336	\$ 63,336
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 400,000	\$ 400,000	\$ 400,000	\$ 400,000
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 754,539	\$ 754,539	\$ -	\$ -	\$ 754,539	\$ 754,539
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 21,112	\$ 21,112	\$ 21,112	\$ 21,112
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 754,539		\$ 4,512,205		\$ 5,266,744

**ITC T032 (Segment B)**

**H. Churchtown Substation - Install**

Estimate Revision: **8**

Total: \$ **2,452,922**

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>H. Churchtown Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 30,835	\$ 95,225	\$ 126,060
2. SUBSTATION FOUNDATIONS	\$ 150,147	\$ 160,800	\$ 310,947
3. SUBSTATION STRUCTURES	\$ 52,000	\$ 60,865	\$ 121,730
4. MAJOR EQUIPMENT	\$ 52,000	\$ 60,000	\$ 112,000
5. SMALL EQUIPMENT / MATERIALS	\$ 186,260	\$ 130,500	\$ 316,760
6. CONTROL HOUSE / PANELS	\$ 253,795	\$ 178,795	\$ 432,590
7. MISC ITEMS	\$ 206,790	\$ 350,542	\$ 557,331
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 75,255	\$ 400,249	\$ 475,504
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ <b>1,007,082</b>	\$ <b>1,436,975</b>	\$ <b>2,452,922</b>
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ <b>1,007,082</b>	\$ <b>1,436,975</b>	\$ <b>2,452,922</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>H. Churchtown Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0.25	ACRES	\$ -	\$ -	\$ 230,000	\$ 57,500	\$ 230,000	\$ 57,500
1.2	Station stone within substation fence.	105	CY	\$ 27	\$ 2,835	\$ 75	\$ 7,875	\$ 102	\$ 10,710
1.3	Substation Fence	280	LF	\$ 100	\$ 28,000	\$ 100	\$ 28,000	\$ 200	\$ 56,000
1.4	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 30,835		\$ 95,225		\$ 126,060
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	0	EA	\$ 14,940	\$ -	\$ 16,000	\$ -	\$ 30,940	\$ -
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1k	Arrester Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1m	Wave Trap Stand Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	1	EA	\$ 5,229	\$ 5,229	\$ 5,600	\$ 5,600	\$ 10,829	\$ 10,829
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	4	EA	\$ 16,434	\$ 65,736	\$ 17,600	\$ 70,400	\$ 34,034	\$ 136,136
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	2	EA	\$ 2,988	\$ 5,976	\$ 3,200	\$ 6,400	\$ 6,188	\$ 12,376
2.3f	Fuse Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	2	EA	\$ 2,988	\$ 5,976	\$ 3,200	\$ 6,400	\$ 6,188	\$ 12,376
2.3h	Bus Support 1 Ph Foundations	3	EA	\$ 2,988	\$ 8,964	\$ 3,200	\$ 9,600	\$ 6,188	\$ 18,564
2.3j	Instrument Transformer Stand Foundations	9	EA	\$ 2,988	\$ 26,892	\$ 3,200	\$ 28,800	\$ 6,188	\$ 55,692
2.3k	Arrester Stand Foundations	3	EA	\$ 2,988	\$ 8,964	\$ 3,200	\$ 9,600	\$ 6,188	\$ 18,564
2.3m	Wave Trap Stand Foundations	1	EA	\$ 2,988	\$ 2,988	\$ 3,200	\$ 3,200	\$ 6,188	\$ 6,188
2.3n	Station Service Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.3p	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House / Pad	1	EA	\$ 8,964	\$ 8,964	\$ 9,600	\$ 9,600	\$ 18,564	\$ 18,564
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
2.5c	Station Service Distribution Line - 1ph.	0	LS	\$ -	\$ -	\$ 6,500	\$ -	\$ 6,500	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	2	EA	\$ 5,229	\$ 10,458	\$ 5,600	\$ 11,200	\$ 10,829	\$ 21,658
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 150,147		\$ 160,800		\$ 310,947
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1h	Arrester Stand	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.1j	Wave Trap Stand	0	EA	\$ 7,400	\$ -	\$ 7,400	\$ -	\$ 14,800	\$ -
3.1k	Lightning Masts - 70'	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	1	EA	\$ 18,500	\$ 18,500	\$ 18,500	\$ 18,500	\$ 37,000	\$ 37,000
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	1	EA	\$ 7,955	\$ 7,955	\$ 7,955	\$ 7,955	\$ 15,910	\$ 15,910
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	1	EA	\$ 3,330	\$ 3,330	\$ 3,330	\$ 3,330	\$ 6,660	\$ 6,660
3.3f	Bus Support 1 Ph	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.3g	Instrument Transformer Stand	9	EA	\$ 740	\$ 6,660	\$ 740	\$ 6,660	\$ 1,480	\$ 13,320
3.3h	Arrester Stand	3	EA	\$ 740	\$ 2,220	\$ 740	\$ 2,220	\$ 1,480	\$ 4,440
3.3j	Wave Trap Stand	1	EA	\$ 3,700	\$ 3,700	\$ 3,700	\$ 3,700	\$ 7,400	\$ 7,400
3.3k	Lightning Mast	2	EA	\$ 6,475	\$ 12,950	\$ 6,475	\$ 12,950	\$ 12,950	\$ 25,900
3.3l	Station Service Transformer Support Stand	0	EA	\$ 1,110	\$ -	\$ 1,110	\$ -	\$ 2,220	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ 60,865		\$ 60,865		\$ 121,730
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	0	EA	\$ 200,000	\$ -	\$ 80,000	\$ -	\$ 280,000	\$ -
4.1b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
4.1c	345 kV - 230 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	1	EA	\$ 52,000	\$ 52,000	\$ 60,000	\$ 60,000	\$ 112,000	\$ 112,000
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ 52,000		\$ 60,000		\$ 112,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	0	EA	\$ 40,000	\$ -	\$ 15,000	\$ -	\$ 55,000	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 35,000	\$ -	\$ 17,500	\$ -	\$ 52,500	\$ -
5.1c	VT'S	0	EA	\$ 25,000	\$ -	\$ 12,000	\$ -	\$ 37,000	\$ -
5.1d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1e	CCVT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1f	Arresters	0	EA	\$ 6,500	\$ -	\$ 1,500	\$ -	\$ 8,000	\$ -
5.1g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	1	EA	\$ 33,000	\$ 33,000	\$ 15,000	\$ 15,000	\$ 48,000	\$ 48,000
5.3b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 28,000	\$ 28,000	\$ 17,500	\$ 17,500	\$ 45,500	\$ 45,500
5.3c	VT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.3d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.3e	CCVT'S	3	EA	\$ 8,000	\$ 24,000	\$ 8,000	\$ 24,000	\$ 16,000	\$ 48,000
5.3f	Arresters	3	EA	\$ 3,420	\$ 10,260	\$ 6,000	\$ 18,000	\$ 9,420	\$ 28,260
5.3g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.3h	Station Service Transformers	0	EA	\$ 75,000	\$ -	\$ 35,000	\$ -	\$ 110,000	\$ -
5.3j	Fuses	0	EA	\$ 7,500	\$ -	\$ 3,600	\$ -	\$ 11,100	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 186,260		\$ 130,500		\$ 316,760
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE	1	EA	\$ 76,800	\$ 76,800	\$ 76,800	\$ 76,800	\$ 153,600	\$ 153,600
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 10,000	\$ 30,000	\$ 45,000	\$ 135,000
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 71,995	\$ 71,995	\$ 71,995	\$ 71,995	\$ 143,990	\$ 143,990
6.5	SCADA and Communications	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 253,795		\$ 178,795		\$ 432,590
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	90.0	LF	\$ 185.00	\$ 16,650	\$ 170.00	\$ 15,300	\$ 355	\$ 31,950
7.2	Rigid Bus, Fittings & Insulators	240.0	LF	\$ 125.07	\$ 30,017	\$ 237.10	\$ 56,904	\$ 362	\$ 86,921
7.3	Strain Bus, Connectors & Insulators	0.0	LF	\$ 39.30	\$ -	\$ 53.35	\$ -	\$ 93	\$ -
7.4	Grounding System	1,100.0	LF	\$ 6.93	\$ 7,623	\$ 32.58	\$ 35,838	\$ 40	\$ 43,461
7.5	Strain Bus Insulators - 345kV	0	EA	\$ 2,000	\$ -	\$ 1,050	\$ -	\$ 3,050	\$ -
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 62,500	\$ 62,500	\$ 62,500	\$ 62,500	\$ 125,000	\$ 125,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 90,000	\$ 90,000	\$ 180,000	\$ 180,000	\$ 270,000	\$ 270,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 206,790		\$ 350,542		\$ 557,331
<b>H. Churchtown Substation - Install</b>					\$ 940,692		\$ 1,036,727		\$ 1,977,418
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 19,774	\$ 19,774	\$ 19,774	\$ 19,774
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 95,145	\$ 95,145	\$ 95,145	\$ 95,145
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 19,774	\$ 19,774	\$ 19,774	\$ 19,774
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 19,774	\$ 19,774	\$ 19,774	\$ 19,774
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 158,193	\$ 158,193	\$ 158,193	\$ 158,193
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	4	Site	\$ -	\$ -	\$ 3,500	\$ 14,000	\$ 3,500	\$ 14,000
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 13,842	\$ 13,842	\$ 13,842	\$ 13,842
<b>Testing &amp; Commissioning</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 49,435	\$ 49,435	\$ 49,435	\$ 49,435
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 5,932	\$ 5,932	\$ 5,932	\$ 5,932
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	1	LS	\$ -	\$ -	\$ 2,400	\$ 2,400	\$ 2,400	\$ 2,400
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 75,255	\$ 75,255	\$ -	\$ -	\$ 75,255	\$ 75,255
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 1,977	\$ 1,977	\$ 1,977	\$ 1,977
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 75,255		\$ 400,249		\$ 475,504

Estimate Revision: 8

Total: \$ -

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>I. Churchtown Substation - Removal</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ -	\$ -	\$ -
2. SUBSTATION FOUNDATIONS	\$ -	\$ -	\$ -
3. SUBSTATION STRUCTURES	\$ -	\$ -	\$ -
4. MAJOR EQUIPMENT	\$ -	\$ -	\$ -
5. SMALL EQUIPMENT / MATERIALS	\$ -	\$ -	\$ -
6. CONTROL HOUSE / PANELS	\$ -	\$ -	\$ -
7. MISC ITEMS	\$ -	\$ -	\$ -
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ -	\$ -	\$ -
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ -	\$ -	\$ -
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ -	\$ -	\$ -

0.0%

0.0%

Description of Work:

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>I. Churchtown Substation - Removal</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.		ACRES	\$ -	\$ -	\$ 250,000	\$ -	\$ 250,000	\$ -
1.2	Station stone within substation fence.		CY	\$ -	\$ -	\$ 75	\$ -	\$ 75	\$ -
1.3	Substation Fence		LF	\$ -	\$ -	\$ 35	\$ -	\$ 35	\$ -
1.4									
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ -		\$ -		\$ -
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1b	Capacitor Bank Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1e	Switch Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1f	Station Service Transformer Stand Foundation		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1g	Bus Support 3ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1j	Instrument Transformer Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1k	Arrester Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1m	Wave Trap Stand Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1n	Misc. Structure Foundations		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

2.1p										
<b>2.2</b>	<b>230kV</b>									
2.2a	Circuit Breaker Foundations	EA	\$ -	\$ -	\$ 7,200	\$ -	\$ 7,200	\$ -	\$ -	
2.2b	Capacitor Bank Foundations	EA	\$ -	\$ -	\$ 32,000	\$ -	\$ 32,000	\$ -	\$ -	
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	EA	\$ -	\$ -	\$ 22,000	\$ -	\$ 22,000	\$ -	\$ -	
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	EA	\$ -	\$ -	\$ 11,000	\$ -	\$ 11,000	\$ -	\$ -	
2.2e	Switch Stand Foundations	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -	\$ -	
2.2f	Station Service Transformer Stand Foundation	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2g	Bus Support 3ph Foundations	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2h	Bus Support 1 Ph Foundations	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -	\$ -	
2.2j	Instrument Transformer Stand Foundations	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -	\$ -	
2.2k	Arrester Stand Foundations	EA	\$ -	\$ -	\$ 2,400	\$ -	\$ 2,400	\$ -	\$ -	
2.2m	Wave Trap Stand Foundations	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2n	Misc. Structure Foundations	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.2p										
<b>2.3</b>	<b>115kV</b>									
<b>2.4</b>	<b>Transformer Foundations</b>									
2.4a	345-230kV Transformer Foundation w/ Oil Containment	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.4b	345-115kV Transformer Foundation w/ Oil Containment	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	EA	\$ -	\$ -	\$ 67,500	\$ -	\$ 67,500	\$ -	\$ -	
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>2.5</b>	<b>Control House Foundations / Pad</b>									
2.5a	Control House / Pad	EA	\$ -	\$ -	\$ 14,200	\$ -	\$ 14,200	\$ -	\$ -	
2.5b	Generator Foundation	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>2.6</b>	<b>Lightning Mast Foundations</b>									
2.6a	70' Lightning Mast Foundation	EA	\$ -	\$ -	\$ 5,200	\$ -	\$ 5,200	\$ -	\$ -	
2.6b			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
2.6c			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ -	\$ -	\$ -	\$ -	\$ -	
<b>3. SUBSTATION STRUCTURES</b>										
<b>3.1</b>	<b>345kV</b>									
3.1a	Substation A-Frame Structures - Stand alone	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1b	Substation A-Frame Structures - Shared Column	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1c	Switch Stands	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1d	Station Service Transformer Stand	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1e	Bus Support 3ph	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1f	Bus Support 1 Ph	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1g	Instrument Transformer Stand	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1h	Arrester Stand	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1j	Wave Trap Stand	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.1k	Misc. Structures	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>3.2</b>	<b>230kV</b>									
3.2a	Substation A-Frame Structures - Stand alone	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -	\$ -	
3.2b	Substation A-Frame Structures - Shared Column	EA	\$ -	\$ -	\$ 27,000	\$ -	\$ 27,000	\$ -	\$ -	
3.2c	Switch Stands	EA	\$ -	\$ -	\$ 9,750	\$ -	\$ 9,750	\$ -	\$ -	
3.2d	Station Service Transformer Stand	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
3.2e	Bus Support 3ph	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -	\$ -	
3.2f	Bus Support 1 Ph	EA	\$ -	\$ -	\$ 2,250	\$ -	\$ 2,250	\$ -	\$ -	

3.2g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2h	Arrester Stand		EA	\$ -	\$ -	\$ 1,050	\$ -	\$ 1,050	\$ -
3.2j	Wave Trap Stand		EA	\$ -	\$ -	\$ 4,500	\$ -	\$ 4,500	\$ -
3.2k	Misc. Structures		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone		EA	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3c	Switch Stands		EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3d	Fuse Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3e	Bus Support 3ph		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3f	Bus Support 1 Ph		EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3g	Instrument Transformer Stand		EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
3.3h	Arrester Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3j	Wave Trap Stand		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.3k	Steel Transmission Pole Deadend (1Ph)		EA	\$ -	\$ -	\$ 12,300	\$ -	\$ 12,300	\$ -
3.4l	Lightning Mast		EA	\$ -	\$ -	\$ 6,450	\$ -	\$ 6,450	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>					\$ -	\$ -	\$ -	\$ -	\$ -
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1b	Capacitor Banks		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1c			EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4.1d									
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers		EA	\$ -	\$ -	\$ 7,000	\$ -	\$ 7,000	\$ -
4.2b	Capacitor Banks		EA	\$ -	\$ -	\$ 42,000	\$ -	\$ 42,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers		EA	\$ -	\$ -	\$ 12,300	\$ -	\$ 12,300	\$ -
4.3b	Capacitor Banks		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>					\$ -	\$ -	\$ -	\$ -	\$ -
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.1c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1e	CCVT'S		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1f	Arresters		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.1g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.1h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -
5.2c	VT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2d	CT'S		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2e	CCVT'S		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -
5.2f	Arresters		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2g	Wave Traps		EA	\$ -	\$ -	\$ 2,500	\$ -	\$ 2,500	\$ -
5.2h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

5.2j										
<b>5.3</b>	<b>115kV</b>									
5.3a	Line Switches - 3ph w/ motor operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -	
5.3b	Disconnect Switches - 3ph w/ manual operator		EA	\$ -	\$ -	\$ 5,500	\$ -	\$ 5,500	\$ -	
5.3c	VT'S		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -	
5.3d	CT'S		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -	
5.3e	CCVT'S		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -	
5.3f	Arresters		EA	\$ -	\$ -	\$ 1,500	\$ -	\$ 1,500	\$ -	
5.3g	Wave Traps		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
5.3h	Station Service Transformers		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
5.3j	Fuses		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>						\$ -	\$ -	\$ -	\$ -	
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>										
6.1	CONTROL HOUSE		EA	\$ -	\$ -	\$ 150,000	\$ -	\$ 150,000	\$ -	
6.2	Protection and Telecom Equipment Panels		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.3	125VDC Batteries		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.4	Control Cables		LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.5	SCADA and Communications		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.6	Low Voltage AC Distribution		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.7	DC Distribution System		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.8	Security		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.9	Fire Alarm		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6.10	Generator		EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>						\$ -	\$ -	\$ -	\$ -	
<b>7. MISC ITEMS</b>										
7.1	Conduit & Cable Trench System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -	
7.2	Rigid Bus, Fittings & Insulators		LF	\$ -	\$ -	\$ 46.88	\$ -	\$ 47	\$ -	
7.3	Strain Bus, Connectors & Insulators		LF	\$ -	\$ -	\$ 39.35	\$ -	\$ 39	\$ -	
7.4	Grounding System		LS	\$ -	\$ -	\$ 42,000.00	\$ -	\$ 42,000	\$ -	
7.5										
7.6										
7.7										
7.8										
7.9										
7.10										
7.11										
7.12										
7.13										
7.14										
7.15										
<b>TOTAL - MISC ITEMS</b>						\$ -	\$ -	\$ -	\$ -	
<b>I. Churchtown Substation - Removal</b>						\$ -	\$ -	\$ -	\$ -	
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>										
<b>Contractor Mobilization / Demobilization</b>										
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Project Management, Material Handling &amp; Amenities</b>										

8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ -	\$ -	\$ -	\$ -
8.3	Utility PM and Project Oversight	1	LS		\$ -	\$ -	\$ -	\$ -	\$ -
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Engineering</b>								
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.6	LIDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.8	Surveying/Staking	-	Site	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.13	Real Estate Costs (New)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.19	Fees for permits, including roadway, railroad, building or other local permits	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>						\$ -	\$ -	\$ -	\$ -

**ITC T032 (Segment B)**

**J. Pleasant Valley Substation - Install**

Estimate Revision: **8**

Total: \$ **3,855,941**

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>J. Pleasant Valley Substation - Install</b>			
1. SITE PREP/ GRADING/ FENCING / CIVIL	\$ 11,025	\$ 14,625	\$ 25,650
2. SUBSTATION FOUNDATIONS	\$ 151,466	\$ 160,900	\$ 312,366
3. SUBSTATION STRUCTURES	\$ 44,400	\$ 44,400	\$ 88,800
4. MAJOR EQUIPMENT	\$ 200,000	\$ 80,000	\$ 280,000
5. SMALL EQUIPMENT / MATERIALS	\$ 260,500	\$ 129,000	\$ 389,500
6. CONTROL HOUSE / PANELS	\$ 560,900	\$ 253,400	\$ 814,300
7. MISC ITEMS	\$ 594,450	\$ 596,075	\$ 1,190,525
8. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 145,819	\$ 608,981	\$ 754,800
<b>CONTRACTOR MARK-UP (OH&amp;P)</b>	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	\$ 1,968,560	\$ 1,887,381	\$ 3,855,941
<b>CONTINGENCY ON ENTIRE PROJECT</b>	\$ -	\$ -	\$ -
<b>TOTAL:</b>	\$ 1,968,560	\$ 1,887,381	\$ 3,855,941

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>J. Pleasant Valley Substation - Install</b>									
<b>1. SITE PREP/ GRADING/ FENCING / CIVIL</b>									
1.1	Site Works including clearing, sediment controls, rough grading, and final grading.	0	ACRES	\$ -	\$ -	\$ 230,000	\$ -	\$ 230,000	\$ -
1.2	Station stone within substation fence.	75	CY	\$ 27	\$ 2,025	\$ 75	\$ 5,625	\$ 102	\$ 7,650
1.3	Substation Fence	90	LF	\$ 100	\$ 9,000	\$ 100	\$ 9,000	\$ 200	\$ 18,000
1.4	Permanent Access Road - 20'-Wide	0	LF	\$ 35	\$ -	\$ 285	\$ -	\$ 320	\$ -
1.5									
1.6									
1.7									
1.8									
1.9									
1.10									
1.11									
1.12									
1.13									
1.14									
1.15									
<b>TOTAL - SITE PREP/ GRADING/ FENCING / CIVIL</b>					\$ 11,025		\$ 14,625		\$ 25,650
<b>2. SUBSTATION FOUNDATIONS</b>									
<b>2.1 345kV</b>									
2.1a	Circuit Breaker Foundations	1	EA	\$ 14,940	\$ 14,940	\$ 16,000	\$ 16,000	\$ 30,940	\$ 30,940
2.1b	Capacitor Bank Foundations	0	EA	\$ 56,025	\$ -	\$ 60,000	\$ -	\$ 116,025	\$ -
2.1c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 26,145	\$ -	\$ 28,000	\$ -	\$ 54,145	\$ -
2.1e	Switch Stand Foundations	6	EA	\$ 4,482	\$ 26,892	\$ 4,800	\$ 28,800	\$ 9,282	\$ 55,692
2.1f	Station Service Transformer Stand Foundation	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1h	Bus Support 1 Ph Foundations	0	EA	\$ 4,482	\$ -	\$ 4,800	\$ -	\$ 9,282	\$ -
2.1j	Instrument Transformer Stand Foundations	9	EA	\$ 4,482	\$ 40,338	\$ 4,800	\$ 43,200	\$ 9,282	\$ 83,538
2.1k	Arrester Stand Foundations	3	EA	\$ 4,482	\$ 13,446	\$ 4,800	\$ 14,400	\$ 9,282	\$ 27,846
2.1m	Wave Trap Stand Foundations	1	EA	\$ 4,482	\$ 4,482	\$ 4,800	\$ 4,800	\$ 9,282	\$ 9,282
2.1n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.1p									
<b>2.2 230kV</b>									
2.2a	Circuit Breaker Foundations	0	EA	\$ 11,952	\$ -	\$ 12,800	\$ -	\$ 24,752	\$ -
2.2b	Capacitor Bank Foundations	0	EA	\$ 44,820	\$ -	\$ 48,000	\$ -	\$ 92,820	\$ -
2.2c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.2d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 22,410	\$ -	\$ 24,000	\$ -	\$ 46,410	\$ -
2.2e	Switch Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2f	Station Service Transformer Stand Foundation	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2g	Bus Support 3ph Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2h	Bus Support 1 Ph Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2j	Instrument Transformer Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2k	Arrester Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2m	Wave Trap Stand Foundations	0	EA	\$ 3,735	\$ -	\$ 4,000	\$ -	\$ 7,735	\$ -
2.2n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.2p									
<b>2.3</b>	<b>115kV</b>								
2.3a	Circuit Breaker Foundations	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.3b	Capacitor Bank Foundations	0	EA	\$ 33,615	\$ -	\$ 36,000	\$ -	\$ 69,615	\$ -
2.3c	Caisson DE Foundations (for DE A frame str. - stand alone)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3d	Caisson DE Foundations (for DE A frame str. - shared column)	0	EA	\$ 16,434	\$ -	\$ 17,600	\$ -	\$ 34,034	\$ -
2.3e	Switch Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3f	Station Service Transformer Stand Foundation	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3g	Bus Support 3ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3h	Bus Support 1 Ph Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3j	Instrument Transformer Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3k	Arrester Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3m	Wave Trap Stand Foundations	0	EA	\$ 2,988	\$ -	\$ 3,200	\$ -	\$ 6,188	\$ -
2.3n	Misc. Structure Foundations	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.3p									
<b>2.4</b>	<b>Transformer Foundations</b>								
2.4a	345-230kV Transformer Foundation w/ Oil Containment	0	EA	\$ 97,110	\$ -	\$ 104,000	\$ -	\$ 201,110	\$ -
2.4b	345-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ 74,700	\$ -	\$ 80,000	\$ -	\$ 154,700	\$ -
2.4c	230kV-115kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.4d	115kV-69kV Transformer Foundation w/ Oil Containment	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>2.5</b>	<b>Control House Foundations / Pad</b>								
2.5a	Control House Addition Foundation (25-ft x 50-ft)	1	EA	\$ 51,368	\$ 51,368	\$ 53,700	\$ 53,700	\$ 105,068	\$ 105,068
2.5b	Generator Foundation	0	EA	\$ 16,000	\$ -	\$ 17,000	\$ -	\$ 33,000	\$ -
<b>2.6</b>	<b>Lightning Mast Foundations</b>								
2.6a	70' Lightning Mast Foundation	0	EA	\$ 5,229	\$ -	\$ 5,600	\$ -	\$ 10,829	\$ -
2.6b		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.6c		0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SUBSTATION FOUNDATIONS</b>					\$ 151,466		\$ 160,900		\$ 312,366
<b>3. SUBSTATION STRUCTURES</b>									
<b>3.1</b>	<b>345kV</b>								
3.1a	Substation A-Frame Structures - Stand alone	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1b	Substation A-Frame Structures - Shared Column	0	EA	\$ 37,000	\$ -	\$ 37,000	\$ -	\$ 74,000	\$ -
3.1c	Switch Stands	1	EA	\$ 14,800	\$ 14,800	\$ 14,800	\$ 14,800	\$ 29,600	\$ 29,600
3.1d	Station Service Transformer Stand	0	EA	\$ 14,800	\$ -	\$ 14,800	\$ -	\$ 29,600	\$ -
3.1e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.1f	Bus Support 1 Ph	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.1g	Instrument Transformer Stand	9	EA	\$ 1,850	\$ 16,650	\$ 1,850	\$ 16,650	\$ 3,700	\$ 33,300
3.1h	Arrester Stand	3	EA	\$ 1,850	\$ 5,550	\$ 1,850	\$ 5,550	\$ 3,700	\$ 11,100
3.1j	Wave Trap Stand	1	EA	\$ 7,400	\$ 7,400	\$ 7,400	\$ 7,400	\$ 14,800	\$ 14,800
3.1k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.2</b>	<b>230kV</b>								
3.2a	Substation A-Frame Structures - Stand alone	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2b	Substation A-Frame Structures - Shared Column	0	EA	\$ 33,300	\$ -	\$ 33,300	\$ -	\$ 66,600	\$ -
3.2c	Switch Stands	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2d	Station Service Transformer Stand	0	EA	\$ 12,025	\$ -	\$ 12,025	\$ -	\$ 24,050	\$ -
3.2e	Bus Support 3ph	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2f	Bus Support 1 Ph	0	EA	\$ 2,775	\$ -	\$ 2,775	\$ -	\$ 5,550	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
3.2g	Instrument Transformer Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2h	Arrester Stand	0	EA	\$ 1,295	\$ -	\$ 1,295	\$ -	\$ 2,590	\$ -
3.2j	Wave Trap Stand	0	EA	\$ 5,550	\$ -	\$ 5,550	\$ -	\$ 11,100	\$ -
3.2k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>3.3</b>	<b>115kV</b>								
3.3a	Substation A-Frame Structures - Stand alone	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3b	Substation A-Frame Structures - Shared Column	0	EA	\$ 18,500	\$ -	\$ 18,500	\$ -	\$ 37,000	\$ -
3.3c	Switch Stands	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3d	Fuse Stand	0	EA	\$ 7,955	\$ -	\$ 7,955	\$ -	\$ 15,910	\$ -
3.3e	Bus Support 3ph	0	EA	\$ 3,330	\$ -	\$ 3,330	\$ -	\$ 6,660	\$ -
3.3f	Bus Support 1 Ph	0	EA	\$ 1,850	\$ -	\$ 1,850	\$ -	\$ 3,700	\$ -
3.3g	Instrument Transformer Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3h	Arrester Stand	0	EA	\$ 740	\$ -	\$ 740	\$ -	\$ 1,480	\$ -
3.3j	Wave Trap Stand	0	EA	\$ 3,700	\$ -	\$ 3,700	\$ -	\$ 7,400	\$ -
3.3k	Misc. Structures	0	EA	\$ 6,475	\$ -	\$ 6,475	\$ -	\$ 12,950	\$ -
<b>TOTAL - SUBSTATION STRUCTURES</b>						\$ 44,400	\$ 44,400		\$ 88,800
<b>4. MAJOR EQUIPMENT</b>									
<b>4.1</b>	<b>345kV</b>								
4.1a	Circuit Breakers	1	EA	\$ 200,000	\$ 200,000	\$ 80,000	\$ 80,000	\$ 280,000	\$ 280,000
4.1b	Capacitor Banks - W/ Center Tap VT and Reactors	0	EA	\$ 370,000	\$ -	\$ 80,000	\$ -	\$ 450,000	\$ -
4.1c	Circuit Breakers - Cap Switching	0	EA	\$ 220,000	\$ -	\$ 750,000	\$ -	\$ 970,000	\$ -
4.1d	345 kV - 115 kV Auto Transformer	0	EA	\$ -	\$ -	\$ 750,000	\$ -	\$ 750,000	\$ -
<b>4.2</b>	<b>230kV</b>								
4.2a	Circuit Breakers	0	EA	\$ 115,000	\$ -	\$ 80,000	\$ -	\$ 195,000	\$ -
4.2b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 80,000	\$ -	\$ 80,000	\$ -
<b>4.3</b>	<b>115kV</b>								
4.3a	Circuit Breakers	0	EA	\$ 52,000	\$ -	\$ 60,000	\$ -	\$ 112,000	\$ -
4.3b	Capacitor Banks	0	EA	\$ -	\$ -	\$ 60,000	\$ -	\$ 60,000	\$ -
<b>TOTAL - MAJOR EQUIPMENT</b>						\$ 200,000	\$ 80,000		\$ 280,000
<b>5. SMALL EQUIPMENT / MATERIALS</b>									
<b>5.1</b>	<b>345kV</b>								
5.1a	Line Switches - 3ph w/ motor operator	1	EA	\$ 40,000	\$ 40,000	\$ 15,000	\$ 15,000	\$ 55,000	\$ 55,000
5.1b	Disconnect Switches - 3ph w/ manual operator	1	EA	\$ 35,000	\$ 35,000	\$ 17,500	\$ 17,500	\$ 52,500	\$ 52,500
5.1c	VT'S	3	EA	\$ 25,000	\$ 75,000	\$ 12,000	\$ 36,000	\$ 37,000	\$ 111,000
5.1d	CT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1e	CCVT'S	3	EA	\$ 13,000	\$ 39,000	\$ 8,000	\$ 24,000	\$ 21,000	\$ 63,000
5.1f	Arresters	3	EA	\$ 6,500	\$ 19,500	\$ 1,500	\$ 4,500	\$ 8,000	\$ 24,000
5.1g	Wave Traps	1	EA	\$ 13,000	\$ 13,000	\$ 8,000	\$ 8,000	\$ 21,000	\$ 21,000
5.1h	Station Service Transformers	0	EA	\$ 200,000	\$ -	\$ 50,000	\$ -	\$ 250,000	\$ -
5.1j									
<b>5.2</b>	<b>230kV</b>								
5.2a	Line Switches - 3ph w/ motor operator	0	EA	\$ 35,000	\$ -	\$ 15,000	\$ -	\$ 50,000	\$ -
5.2b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 30,000	\$ -	\$ 17,500	\$ -	\$ 47,500	\$ -
5.2c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2e	CCVT'S	0	EA	\$ 10,000	\$ -	\$ 6,000	\$ -	\$ 16,000	\$ -
5.2f	Arresters	0	EA	\$ 5,000	\$ -	\$ 6,000	\$ -	\$ 11,000	\$ -
5.2g	Wave Traps	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.2h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.2j									
<b>5.3</b>	<b>115kV</b>								
5.3a	Line Switches - 3ph w/ motor operator	0	EA	\$ 33,000	\$ -	\$ 15,000	\$ -	\$ 48,000	\$ -
5.3b	Disconnect Switches - 3ph w/ manual operator	0	EA	\$ 28,000	\$ -	\$ 17,500	\$ -	\$ 45,500	\$ -
5.3c	VT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3d	CT'S	0	EA	\$ 13,000	\$ -	\$ 8,000	\$ -	\$ 21,000	\$ -
5.3e	CCVT'S	0	EA	\$ 8,000	\$ -	\$ 8,000	\$ -	\$ 16,000	\$ -
5.3f	Arresters	0	EA	\$ 3,420	\$ -	\$ 6,000	\$ -	\$ 9,420	\$ -
5.3g	Wave Traps	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
5.3h	Station Service Transformers	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.3j	Fuses	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL - SMALL EQUIPMENT / MATERIALS</b>					\$ 260,500		\$ 129,000		\$ 389,500
<b>6. CONTROL HOUSE / PANELS / GENERATOR</b>									
6.1	CONTROL HOUSE Addition (25-ft x 50-ft)	1	EA	\$ 325,000	\$ 325,000	\$ 85,000	\$ 85,000	\$ 410,000	\$ 410,000
6.2	Protection and Telecom Equipment Panels	3	EA	\$ 35,000	\$ 105,000	\$ 12,500	\$ 37,500	\$ 47,500	\$ 142,500
6.3	125VDC Batteries	0	EA	\$ 75,000	\$ -	\$ 25,000	\$ -	\$ 100,000	\$ -
6.4	Control Cables	1	LS	\$ 130,900	\$ 130,900	\$ 130,900	\$ 130,900	\$ 261,800	\$ 261,800
6.5	SCADA and Communications	0	EA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.6	Low Voltage AC Distribution	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.7	DC Distribution System	0	EA	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ 150,000	\$ -
6.8	Security	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.9	Fire Alarm	0	EA	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ 15,000	\$ -
6.10	Generator	0	EA	\$ 100,000	\$ -	\$ 80,000	\$ -	\$ 180,000	\$ -
<b>TOTAL - CONTROL HOUSE / PANELS / GENERATOR</b>					\$ 560,900		\$ 253,400		\$ 814,300
<b>7. MISC ITEMS</b>									
7.1	Conduit & Cable Trench System	800	LF	\$ 185.00	\$ 148,000	\$ 170.00	\$ 136,000	\$ 355	\$ 284,000
7.2	Rigid Bus, Fittings & Insulators	0	LF	\$ 125.07	\$ -	\$ 237.10	\$ -	\$ 362	\$ -
7.3	Strain Bus, Connectors & Insulators	2,500	LF	\$ 13.38	\$ 33,450	\$ 39.35	\$ 98,375	\$ 53	\$ 131,825
7.4	Grounding System	0	LF	\$ 6.93	\$ -	\$ 32.58	\$ -	\$ 40	\$ -
7.5	Strain Bus Insulators - 345kV	54	EA	\$ 2,000	\$ 108,000	\$ 1,050	\$ 56,700	\$ 3,050	\$ 164,700
7.6	Strain Bus Insulators - 230kV	0	EA	\$ 1,400	\$ -	\$ 750	\$ -	\$ 2,150	\$ -
7.7	Strain Bus Insulators - 115kV	0	EA	\$ 1,000	\$ -	\$ 550	\$ -	\$ 1,550	\$ -
7.8	Low Voltage AC Station Service	0	LS	\$ 50,000	\$ -	\$ 75,000	\$ -	\$ 125,000	\$ -
7.9	SSVT Service	0	LS	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ 90,000	\$ -
7.10	Control Conduits from Trench to Equipment	1	LS	\$ 125,000	\$ 125,000	\$ 125,000	\$ 125,000	\$ 250,000	\$ 250,000
7.11	Misc. Materials (Above and Below Ground)	1	LS	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 360,000	\$ 360,000
7.12									
7.13									
7.14									
7.15									
7.16									
7.17									
7.18									
7.19									
7.20									
7.21									
7.22									
7.23									
7.24									
7.25									
<b>TOTAL - MISC ITEMS</b>					\$ 594,450		\$ 596,075		\$ 1,190,525
<b>J. Pleasant Valley Substation - Install</b>					\$ 1,822,741		\$ 1,278,400		\$ 3,101,141
<b>8. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
8.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 31,011	\$ 31,011	\$ 31,011	\$ 31,011
<b>Project Management, Material Handling &amp; Amenities</b>									
8.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 149,215	\$ 149,215	\$ 149,215	\$ 149,215
8.3	Utility PM and Project Oversight	1	LS	\$ -	\$ -	\$ 31,011	\$ 31,011	\$ 31,011	\$ 31,011
8.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 31,011	\$ 31,011	\$ 31,011	\$ 31,011
<b>Engineering</b>									
8.5	Design Engineering	1	LS	\$ -	\$ -	\$ 248,091	\$ 248,091	\$ 248,091	\$ 248,091
8.6	LiDAR	-	Mile	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.7	Geotech	2	EA	\$ -	\$ -	\$ 3,500	\$ 7,000	\$ 3,500	\$ 7,000

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
8.8	Surveying/Staking	1	Site	\$ -	\$ -	\$ 21,708	\$ 21,708	\$ 21,708	\$ 21,708
	<b>Testing &amp; Commissioning</b>								
8.9	Testing & Commissioning of T-Line and Equipment	1	LS	\$ -	\$ -	\$ 77,529	\$ 77,529	\$ 77,529	\$ 77,529
	<b>Permitting and Additional Costs</b>								
8.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 9,303	\$ 9,303	\$ 9,303	\$ 9,303
8.13	Real Estate Costs (New)	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.14	Real Estate Costs (Incumbent Utility)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.15	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.16	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.17		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
8.18	Sales Tax on Materials	1	LS	\$ 145,819	\$ 145,819	\$ -	\$ -	\$ 145,819	\$ 145,819
8.19	Fees for permits, including roadway, railroad, building or other local permits	1	LS		\$ -	\$ 3,101	\$ 3,101	\$ 3,101	\$ 3,101
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 145,819		\$ 608,981		\$ 754,800

**ITC T032 (Segment B)**

**K. Interconnection Knickerbocker Station**

Estimate Revision: **8** Total: \$ 3,623,034

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>K. Interconnection Knickerbocker Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 436,850	\$ 436,850
2. FOUNDATIONS	\$ 756,457	\$ 764,558	\$ 1,521,015
3. STRUCTURES	\$ 556,300	\$ 370,424	\$ 926,724
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 128,000	\$ 55,640	\$ 183,640
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 115,261	\$ 439,544	\$ 554,805
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 1,556,017</b>	<b>\$ 2,067,017</b>	<b>\$ 3,623,034</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 1,556,017</b>	<b>\$ 2,067,017</b>	<b>\$ 3,623,034</b>

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>K. Interconnection Knickerbocker Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	35,000.0	SF	\$ -	\$ -	\$ 4	\$ 123,200	\$ 4	\$ 123,200
1.10	Restoration for Work Pad areas	7,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,050	\$ 0	\$ 1,050
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>				\$ -	\$ -	\$ 436,850	\$ 436,850	\$ 436,850	\$ 436,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Tangent	2	EA	\$ 64,635	\$ 129,270	\$ 65,327	\$ 130,654	\$ 129,962	\$ 259,924
2.2	Drilled Pier - 115kV Single Circuit Single Pole Angle/DE	1	EA	\$ 76,484	\$ 76,484	\$ 77,303	\$ 77,303	\$ 153,787	\$ 153,787
2.3	Drilled Pier - 345kV Single Circuit H-Pole Angle /DE	4	EA	\$ 137,676	\$ 550,703	\$ 139,150	\$ 556,601	\$ 276,826	\$ 1,107,304
2.4									
2.5	Rock Excavation Adder	-	CY	\$ -	\$ -	\$ 2,000	\$ -	\$ 2,000	\$ -
2.6				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.7				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.8				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.9				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.10				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.11				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.12				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.13				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2.14				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 756,457		\$ 764,558		\$ 1,521,015
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	1	Structure	\$ 55,315	\$ 55,315	\$ 33,189	\$ 33,189	\$ 88,504	\$ 88,504
3.2	115kV Single Circuit Single Pole Tangent	2	Structure	\$ 39,261	\$ 78,521	\$ 23,556	\$ 47,113	\$ 62,817	\$ 125,634
3.3	345kV Single Circuit Single Pole Angle /DE	4	Structure	\$ 104,730	\$ 418,921	\$ 62,838	\$ 251,353	\$ 167,569	\$ 670,274
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	7	Structure	\$ 506	\$ 3,542	\$ 5,539	\$ 38,770	\$ 6,045	\$ 42,312
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 556,300		\$ 370,424		\$ 926,724
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9					\$ -		\$ -		\$ -
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	12	Assembly	\$ 900	\$ 10,800	\$ 560	\$ 6,720	\$ 1,460	\$ 17,520
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	60	Assembly	\$ 1,800	\$ 108,000	\$ 720	\$ 43,200	\$ 2,520	\$ 151,200
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	7	Assembly	\$ 900	\$ 6,300	\$ 560	\$ 3,920	\$ 1,460	\$ 10,220
5.5			Assembly		\$ -		\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	2	Assembly	\$ 200	\$ 400	\$ 150	\$ 300	\$ 350	\$ 700
5.7	OPGW Assembly - Angle / DE	10	Assembly	\$ 250	\$ 2,500	\$ 150	\$ 1,500	\$ 400	\$ 4,000
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 128,000		\$ 55,640		\$ 183,640
<b>K. Interconnection Knickerbocker Station</b>					\$ 1,440,757		\$ 1,627,472		\$ 3,068,229
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Job / Demob	1	LS	\$ -	\$ -	\$ 30,682	\$ 30,682	\$ 30,682	\$ 30,682
<b>Project Management, Material Handling &amp; Amenities</b>									
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 147,631	\$ 147,631	\$ 147,631	\$ 147,631
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 30,682	\$ 30,682	\$ 30,682	\$ 30,682
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 30,682	\$ 30,682	\$ 30,682	\$ 30,682
<b>Engineering</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 153,411	\$ 153,411	\$ 153,411	\$ 153,411
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 9,205	\$ 9,205	\$ 9,205	\$ 9,205
6.7	Geotech	1.0	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 21,478	\$ 21,478	\$ 21,478	\$ 21,478
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 9,205	\$ 9,205	\$ 9,205	\$ 9,205
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 115,261	\$ 115,261	\$ -	\$ -	\$ 115,261	\$ 115,261
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 3,068	\$ 3,068	\$ 3,068	\$ 3,068
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 115,261		\$ 439,544		\$ 554,805

**ITC T032 (Segment B)**

**L. Interconnection Churchtown Station**

Estimate  
Revision: **8**

**Total: \$ 2,404,297**

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>L. Interconnection Churchtown Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 436,850	\$ 436,850
2. FOUNDATIONS	\$ 212,820	\$ 669,100	\$ 881,920
3. STRUCTURES	\$ 318,188	\$ 353,416	\$ 671,604
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 44,000	\$ 27,410	\$ 71,410
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 46,001	\$ 296,512	\$ 342,513
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
<b>SUBTOTAL:</b>	<b>\$ 621,009</b>	<b>\$ 1,783,288</b>	<b>\$ 2,404,297</b>
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 621,009</b>	<b>\$ 1,783,288</b>	<b>\$ 2,404,297</b>

Description of Work:									
Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>L. Interconnection Churchtown Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	2.0	Acre	\$ -	\$ -	\$ 5,000	\$ 10,000	\$ 5,000	\$ 10,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	3,500.0	LF	\$ -	\$ -	\$ 4	\$ 14,000	\$ 4	\$ 14,000
1.5	Matting - Access and ROW	3,500.0	LF	\$ -	\$ -	\$ 70	\$ 245,000	\$ 70	\$ 245,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	35,000.0	SF	\$ -	\$ -	\$ 4	\$ 123,200	\$ 4	\$ 123,200
1.10	Restoration for Work Pad areas	7,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 1,050	\$ 0	\$ 1,050
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>				\$ -	\$ -	\$ -	\$ 436,850	\$ -	\$ 436,850
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit H- Pole Angle/ DE	2	EA	\$ 30,403	\$ 60,806	\$ 30,729	\$ 61,457	\$ 61,131	\$ 122,263
2.2	Drilled Pier - 115kV Single Circuit H- Pole Tangent	3	EA	\$ 30,403	\$ 91,209	\$ 30,729	\$ 92,186	\$ 61,131	\$ 183,394
2.3	Drilled Pier - 115kV Single Circuit Single Pole Angle/ DE	2	EA	\$ 30,403	\$ 60,806	\$ 30,729	\$ 61,457	\$ 61,131	\$ 122,263
2.4									
2.5	Rock Excavation Adder	227	CY	\$ -	\$ -	\$ 2,000	\$ 454,000	\$ 2,000	\$ 454,000
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 212,820		\$ 669,100		\$ 881,920
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/ DE	4	Structure	\$ 49,216	\$ 196,864	\$ 49,216	\$ 196,864	\$ 98,432	\$ 393,728
3.2	115kV Single Circuit Single Pole Tangent	3	Structure	\$ 39,261	\$ 117,782	\$ 39,261	\$ 117,782	\$ 78,521	\$ 235,564
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	7	Structure	\$ 506	\$ 3,542	\$ 5,539	\$ 38,770	\$ 6,045	\$ 42,312
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 318,188		\$ 353,416		\$ 671,604
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EH57 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	18	Assembly	\$ 900	\$ 16,200	\$ 560	\$ 10,080	\$ 1,460	\$ 26,280
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	28	Assembly	\$ 900	\$ 25,200	\$ 560	\$ 15,680	\$ 1,460	\$ 40,880
5.5			Assembly		\$ -		\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	3	Assembly	\$ 200	\$ 600	\$ 150	\$ 450	\$ 350	\$ 1,050
5.7	OPGW Assembly - Angle / DE	8	Assembly	\$ 250	\$ 2,000	\$ 150	\$ 1,200	\$ 400	\$ 3,200
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 44,000		\$ 27,410		\$ 71,410
<b>L. Interconnection Churchtown Station</b>					\$ 575,008		\$ 1,486,775		\$ 2,061,784
<b>6. MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
	<b>Contractor Mobilization / Demobilization</b>								
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 20,618	\$ 20,618	\$ 20,618	\$ 20,618
	<b>Project Management, Material Handling &amp; Amenities</b>								
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 99,205	\$ 99,205	\$ 99,205	\$ 99,205
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 20,618	\$ 20,618	\$ 20,618	\$ 20,618
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 20,618	\$ 20,618	\$ 20,618	\$ 20,618
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 103,089	\$ 103,089	\$ 103,089	\$ 103,089
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 6,185	\$ 6,185	\$ 6,185	\$ 6,185
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 14,432	\$ 14,432	\$ 14,432	\$ 14,432
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 6,185	\$ 6,185	\$ 6,185	\$ 6,185
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 46,001	\$ 46,001	\$ -	\$ -	\$ 46,001	\$ 46,001
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS			\$ 2,062	\$ 2,062	\$ 2,062	\$ 2,062
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 46,001		\$ 296,512		\$ 342,513

**ITC T032 (Segment B)**

**M. Interconnection Milan Station**

Estimate Revision: **8** Total: \$ **745,311**

ITC T032 (Segment B)			
	Supply	Installation	Total
<b>M. Interconnection Milan Station</b>			
1. CLEARING & ACCESS	\$ -	\$ 121,100	\$ 121,100
2. FOUNDATIONS	\$ 84,375	\$ 135,279	\$ 219,654
3. STRUCTURES	\$ 130,328	\$ 140,393	\$ 270,721
4. CONDUCTOR, SHIELDWIRE, OPGW	\$ -	\$ -	\$ -
5. INSULATORS, FITTINGS, HARDWARE	\$ 13,600	\$ 8,440	\$ 22,040
6. MOB/DEMOB, ENGINEERING, PERMITTING, T&C, PM & INDIRECTS:	\$ 18,264	\$ 93,533	\$ 111,797
CONTRACTOR MARK-UP (OH&P)	\$ -	\$ -	\$ -
SUBTOTAL:	\$ 246,567	\$ 498,744	\$ 745,311
CONTINGENCY ON ENTIRE PROJECT	\$ -	\$ -	\$ -
TOTAL:	\$ 246,567	\$ 498,744	\$ 745,311

**Description of Work:**

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
<b>M. Interconnection Milan Station</b>									
<b>1. CLEARING &amp; ACCESS</b>									
1.1	Clearing the ROW - Heavy (mowing & clearing)	-	Acre	\$ -	\$ -	\$ 15,000	\$ -	\$ 15,000	\$ -
1.2	Clearing the ROW - Light (mowing)	1.0	Acre	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000
1.3	Access Road	-	LF	\$ -	\$ -	\$ 45	\$ -	\$ 45	\$ -
1.4	Silt Fence	500.0	LF	\$ -	\$ -	\$ 4	\$ 2,000	\$ 4	\$ 2,000
1.5	Matting - Access and ROW	500.0	LF	\$ -	\$ -	\$ 70	\$ 35,000	\$ 70	\$ 35,000
1.6	Matting - To Work Area	525.0	LF	\$ -	\$ -	\$ 70	\$ 36,750	\$ 70	\$ 36,750
1.7	Snow Removal	-	LS	\$ -	\$ -	\$ 516,800	\$ -	\$ 516,800	\$ -
1.8	ROW Restoration	0.5	Mile	\$ -	\$ -	\$ 10,000	\$ 5,000	\$ 10,000	\$ 5,000
1.9	Work Pads	10,000.0	SF	\$ -	\$ -	\$ 4	\$ 35,200	\$ 4	\$ 35,200
1.10	Restoration for Work Pad areas	2,000.0	SF	\$ -	\$ -	\$ 0.2	\$ 300	\$ 0	\$ 300
1.11	Temporary Access Bridge	-	EA	\$ -	\$ -	\$ 20,035	\$ -	\$ 20,035	\$ -
1.12	Air Bridge	-	EA	\$ -	\$ -	\$ 14,445	\$ -	\$ 14,445	\$ -
1.13	Stabilized Construction Entrance	-	EA	\$ -	\$ -	\$ 4,580	\$ -	\$ 4,580	\$ -
1.14	Maintenance and Protection of Traffic on Public Roads	-	EA	\$ -	\$ -	\$ 4,130	\$ -	\$ 4,130	\$ -
1.15	Gates	-	EA	\$ 2,000	\$ -	\$ 2,500	\$ -	\$ 4,500	\$ -
1.16	Culverts / Misc. Access	-	EA	\$ 750	\$ -	\$ 1,250	\$ -	\$ 2,000	\$ -
1.17	Concrete Washout Station	1	EA	\$ -	\$ -	\$ 1,850	\$ 1,850	\$ 1,850	\$ 1,850
1.18				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.19				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1.20	Crushed Rock	0	CY	\$ 27	\$ -	\$ 75	\$ -	\$ 102	\$ -
<b>TOTAL - CLEARING &amp; ACCESS</b>					\$ -		\$ 121,100		\$ 121,100
<b>2. FOUNDATIONS</b>									
2.1	Drilled Pier - 115kV Single Circuit Single Pole Angle/DE	2	EA	\$ 42,187	\$ 84,375	\$ 42,639	\$ 85,279	\$ 84,827	\$ 169,654
2.2									
2.3									
2.4									
2.5	Rock Excavation Adder	25	CY	\$ -	\$ -	\$ 2,000	\$ 50,000	\$ 2,000	\$ 50,000
2.6					\$ -		\$ -		\$ -
2.7					\$ -		\$ -		\$ -
2.8					\$ -		\$ -		\$ -
2.9					\$ -		\$ -		\$ -
2.10					\$ -		\$ -		\$ -
2.11					\$ -		\$ -		\$ -

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
2.12					\$ -		\$ -		\$ -
2.13					\$ -		\$ -		\$ -
2.14					\$ -		\$ -		\$ -
2.15					\$ -		\$ -		\$ -
<b>TOTAL - FOUNDATIONS</b>					\$ 84,375		\$ 135,279		\$ 219,654
<b>3. STRUCTURES</b>									
3.1	115kV Single Circuit Single Pole Angle/DE	2	Structure	\$ 64,658	\$ 129,316	\$ 64,658	\$ 129,316	\$ 129,316	\$ 258,632
3.2									
3.3									
3.4					\$ -		\$ -		\$ -
3.5	Install Grounding and Grounding Accessories	2	Pole	\$ 506	\$ 1,012	\$ 5,539	\$ 11,077	\$ 6,045	\$ 12,089
3.6					\$ -		\$ -		\$ -
3.7					\$ -		\$ -		\$ -
3.8					\$ -		\$ -		\$ -
3.9					\$ -		\$ -		\$ -
3.10					\$ -		\$ -		\$ -
3.11					\$ -		\$ -		\$ -
3.12					\$ -		\$ -		\$ -
3.13					\$ -		\$ -		\$ -
3.14					\$ -		\$ -		\$ -
3.15					\$ -		\$ -		\$ -
<b>TOTAL - STRUCTURES</b>					\$ 130,328		\$ 140,393		\$ 270,721
<b>4. CONDUCTOR, SHIELDWIRE, OPGW</b>									
4.1	345kV - (2) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.2	(1) OPGW 36 Fiber AC-33/38/571	-	LF	\$ 1.35	\$ -	\$ 5.00	\$ -	\$ 6.35	\$ -
4.3	(1) 3/8" EHS7 Steel	-	LF	\$ 0.47	\$ -	\$ 5.00	\$ -	\$ 5.47	\$ -
4.5	Remove Existing 115kV Cable From Existing Structures	-	Mile	\$ -	\$ -	\$ 30,000	\$ -	\$ 30,000.00	\$ -
4.6	Remove Existing OPGW Cable	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.7	Remove Existing EH7	-	Mile	\$ -	\$ -	\$ 12,000	\$ -	\$ 12,000.00	\$ -
4.8	115kV - (1) 954kcmil 54/7 ACSS "Cardinal"	-	LF	\$ 1.90	\$ -	\$ 5.00	\$ -	\$ 6.90	\$ -
4.9									
4.10	Rider Poles - Relocated	-	Set	\$ -	\$ -	\$ 3,500	\$ -	\$ 3,500.00	\$ -
4.11	Rider Poles	-	EA	\$ 1,750	\$ -	\$ 3,500	\$ -	\$ 5,250.00	\$ -
<b>TOTAL: CONDUCTOR, SHIELDWIRE, OPGW:</b>					\$ -		\$ -		\$ -
<b>5. INSULATOR, FITTINGS, HARDWARE</b>									
5.1	345kV Tangent (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.2	115kV Tangent (1-Group of 9-Bells Each Assembly)	-	Assembly	\$ 900	\$ -	\$ 560	\$ -	\$ 1,460	\$ -
5.3	345kV Dead-end & Angle Insulators (1-Group of 18-Bells Each Assembly)	-	Assembly	\$ 1,800	\$ -	\$ 720	\$ -	\$ 2,520	\$ -
5.4	115kV Dead-end & Angle Insulators (1-Group of 9-Bells Each Assembly)	14	Assembly	\$ 900	\$ 12,600	\$ 560	\$ 7,840	\$ 1,460	\$ 20,440
5.5		-	Assembly	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5.6	OPGW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.7	OPGW Assembly - Angle / DE	4	Assembly	\$ 250	\$ 1,000	\$ 150	\$ 600	\$ 400	\$ 1,600
5.8	OHSW Assembly - Tangent	-	Assembly	\$ 200	\$ -	\$ 150	\$ -	\$ 350	\$ -
5.9	OHSW Assembly - Angle / DE	-	Assembly	\$ 250	\$ -	\$ 150	\$ -	\$ 400	\$ -
5.10	OPGW Splice Boxes	-	Set	\$ 1,750	\$ -	\$ 1,746	\$ -	\$ 3,496	\$ -
5.11	OPGW Splice & Test	-	EA	\$ 1,400	\$ -	\$ 2,520	\$ -	\$ 3,920	\$ -
5.12	Spacer - Conductor	-	EA	\$ 50	\$ -	\$ 35	\$ -	\$ 85	\$ -
5.13	Vibration Dampers - Conductor	-	EA	\$ 35	\$ -	\$ 35	\$ -	\$ 70	\$ -
5.14	Shieldwire / OPGW Dampers, Misc. Fittings	-	EA	\$ 27	\$ -	\$ 35	\$ -	\$ 62	\$ -
5.15	Guys, Anchors, and Accessories	-	EA	\$ 720	\$ -	\$ 885	\$ -	\$ 1,605	\$ -
5.16	Misc. materials (Signs and Markers)	-	Mile	\$ 770	\$ -	\$ 1,006	\$ -	\$ 1,776	\$ -
5.17									
5.18									
5.19									
5.20									
<b>TOTAL - INSULATOR, FITTINGS, HARDWARE</b>					\$ 13,600		\$ 8,440		\$ 22,040
<b>M. Interconnection Milan Station</b>					\$ 228,303		\$ 405,211		\$ 633,514
<b>6. MOB/DEMOMB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>									
<b>Contractor Mobilization / Demobilization</b>									
6.1	Mob / Demob	1	LS	\$ -	\$ -	\$ 6,335	\$ 6,335	\$ 6,335	\$ 6,335
<b>Project Management, Material Handling &amp; Amenities</b>									

Item	Item Description	Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Cost	Labor & Equipment Supply Rate	Labor & Equipment Cost	Total Unit Rate	TOTAL
6.2	Project Management & Staffing (includes PM, Field Engineers / Supervision, Scheduler and Cost Manager, SHEQ Staff, and Admin Staff)	1	LS			\$ 30,482	\$ 30,482	\$ 30,482	\$ 30,482
6.3	Utility PM and Project Oversight	1	LS		\$ -	\$ 6,335	\$ 6,335	\$ 6,335	\$ 6,335
6.4	Site Accommodation, Facilities, Storage	1	LS	\$ -	\$ -	\$ 6,335	\$ 6,335	\$ 6,335	\$ 6,335
	<b>Engineering</b>								
6.5	Design Engineering	1	LS	\$ -	\$ -	\$ 31,676	\$ 31,676	\$ 31,676	\$ 31,676
6.6	LiDAR	1	LS	\$ -	\$ -	\$ 1,901	\$ 1,901	\$ 1,901	\$ 1,901
6.7	Geotech	1	Location	\$ -	\$ -	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
6.8	Surveying/Staking	1	LS	\$ -	\$ -	\$ 4,435	\$ 4,435	\$ 4,435	\$ 4,435
	<b>Testing &amp; Commissioning</b>								
6.9	Testing & Commissioning of T-Line and Equipment	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>Permitting and Additional Costs</b>								
6.10	Environmental Licensing & Permitting Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.11	Environmental Mitigation	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.12	Warranties / LOC's	1	LS	\$ -	\$ -	\$ 1,901	\$ 1,901	\$ 1,901	\$ 1,901
6.13	Real Estate Costs	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.14	Legal Fees	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.15	Allowance for Funds Used During Construction (AFUDC)	-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.16		-	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6.17	Sales Tax on Materials	1	LS	\$ 18,264	\$ 18,264	\$ -	\$ -	\$ 18,264	\$ 18,264
6.18	Fees for permits, including roadway, railroad, building or other local permits	1	LS	\$ -	\$ -	\$ 634	\$ 634	\$ 634	\$ 634
<b>TOTAL - MOB/DEMOB, ENGINEERING, PERMITTING, T&amp;C, PM &amp; INDIRECTS:</b>					\$ 18,264		\$ 93,533		\$ 111,797

**NAT & NYPA - T032 - (Segment B)**

**N. NUF to mitigate NY to NE interface transfer limit degradation**

Estimate  
Revision: **8**

**Total: \$ 26,785,714**

SYSTEM UPGRADE FACILITIES		Estimated Quantity	Unit of Measure	Material Supply Rate	Material Supply Sum	Labor & Equipment Supply Rate	Labor & Equipment Sum	Total Unit Rate	TOTAL
<b>SUF 1</b>	<b>Transmission Line Upgrade Cricket Valley - Connecticut Border to Long Mountain</b>								
1.1	Line Upgrade	1.00	LS		\$ -		\$ -	\$ 21,428,571	\$ 21,428,571
	<b>Subtotal SUG 1 Direct Cost</b>				\$ -		\$ -		\$ 21,428,571
2.0	Indirect Cost (25% of Direct Cost)				\$ -		\$ -		\$ 5,357,143
	<b>TOTAL:</b>				\$ -		\$ -		\$ 26,785,714

**ITC T032 (Segment B)**

**ESTIMATE ASSUMPTIONS & CLARIFICATIONS**

1	Cost Estimate is based on 2017 rates.
2	Construction schedule is in accordance with proposed schedule - we have assumed continuous working with no breaks in the schedule. Six months have been added to the construction schedule for start up and close out works and assisting in pre-construction activities (i.e. permitting activities, material procurement etc.).
3	We have assumed a typical work week of five-(5) days per week at ten-(10) hours per day (5 x 10 hour days).
4	All labor rates and benefits used for estimating purposes are taken from IBEW Local 1249 working agreement as updated 5-8-2017.
5	We have assumed that the Access Road included in Developer Estimate will be Type 1 Gravel Type. 20% of the total length of the line is assumed to use Type 1 Gravel road and 80% of the line length access to be used wood matting. In addition 75 feet of wood matting is included from the access matting to the work pad area matting. The estimate also include 5,000 square feet of wood matting for each structure work area within the ROW. For the ground restoration (seed, straw and woven mat), 20% of the work pad area included.
6	Costs will vary for handling and disposal of contaminated spoils, depending on type of contaminants and availability / location of the appropriate tipping facility. Since there is not enough information to provide a quantified estimate for this item, allowance is included in the contingency monies.
7	Costs have been developed based on historical data from Projects of a similar nature (AACE Class 5 and 4 Estimating Practices). We have not engaged any subcontractors for formal quotes.
8	Foundation rates include supply and installation of materials. Drilled Pier rates include supply and testing of concrete, rebar cage and the use of temp or permanent casing.
9	A Contractor Mark-Up (OH&P) of 15% has been included in the Total section.
10	We have assumed that all project details provided are accurate unless noted otherwise.
11	Any SUF pricing includes 35% to cover Contractor markup (15%) and contingency (20%)
12	A contractor allowance of 1% for mobilization and demobilization has been included in the total section.
13	A contractor allowance of 4.184% for project management and staffing has been included in the total section. This also includes agricultural inspector, engineering inspector, safety inspector, compliance inspector, environmental inspector, and SWPP inspector.
14	An allowance of 1% for Utility PM and Project Oversight staffing has been included in the total section.
15	A contractor allowance of 1% for site accommodation, facilities, and storage has been included in the total section.
16	An allowance of 5% for transmission design and engineering has been included in the total section.
17	An allowance of 8% for substation design and engineering has been included in the total section.
18	An allowance of 0.7% for survey and staking of the transmission line and substation layout has been included in the total section.
19	An allowance of 0.3% for LIDAR of the transmission line has been included in the total section.
20	An allowance of 3.75% for substation testing and commissioning has been included in the total section.
21	An allowance of \$20,000.00 per circuit for transmission line testing and commissioning has been included in the total section.
22	New York state sales tax of 8% is included in all material pricing.
23	An allowance of 1.5% for insurance is included in the DPS sheet.
24	Rock excavation not provided in proposal foundation data, all structures are drilled shaft foundation, rock excavation assumed same quantity as in National Grid's proposal.
25	An additional Quantity of 5% have been added to conductors, OPGW, & OHSW for sag and jumpers.
26	Cricket Valley to Long Mountain line upgrade: Network Upgrade (NUF) costs to mitigate NY to NE interface transfer limit degradation were based on possible solutions identified during the June 2018 SIS process
27	The SUF estimates for the stations are rough order of magnitude estimates. No engineering was performed and SECo did not have access to record drawings.

## Appendix E – Market Monitoring Unit Report



# NYISO MMU EVALUATION OF THE PROPOSED AC PUBLIC POLICY TRANSMISSION PROJECTS

**POTOMAC  
ECONOMICS**

By:

David B. Patton, Ph.D.  
Pallas LeeVanSchaick, Ph.D.  
Raghu Palavadi Naga

Market Monitoring Unit  
for the New York ISO

February 2019



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## I. EXECUTIVE SUMMARY

In accordance with Order 1000, the NYISO tariff allows for recovery of the costs of transmission projects that are built to achieve public policy requirements from New York State laws or regulations. The tariff requires NYISO to issue a report detailing its evaluation of the proposed projects and identifying which (if any) is the more efficient or cost-effective project for satisfying the Public Policy Transmission Need (“PPTN”).<sup>1</sup> The tariff also requires the Market Monitoring Unit (“MMU”) to “review and consider” any impact on the ISO-administered markets from regulated transmission solutions proposed to satisfy the PPTN, and then the MMU is to provide a report containing its evaluation to stakeholders before the Management Committee advisory vote on the Public Policy Transmission Planning Report.<sup>2</sup>

The NYPSC issued an order finding a Public Policy Requirement to build:

...a portfolio of 345 kV transmission projects to reconfigure and upgrade transmission facilities from the Edic or Marcy substations to the New Scotland substation with a tie-in to the Rotterdam substation and from a new Knickerbocker substation to the Pleasant Valley substation, with upgrades at the Greenbush substation, including also upgrades to the Rock Tavern substation, and the construction of a new double circuit 138 kV line from the Shoemaker to Sugarloaf substations...

While the Public Policy Requirement identified a long list of standard wholesale market objectives such as cost savings and reliability that would be achieved by these projects, it also identified several objectives that are outside the ordinary scope of the wholesale market, including: serving more load in downstate areas from efficient and/or renewable resources upstate, promoting job growth, increasing tax receipts, and reducing generation with harmful environmental and health effects.<sup>3</sup>

The order stated that this leads to a Public Policy Transmission Need, which included specific upgrades that would constitute each of the projects listed in the Public Policy Requirement, where the projects involving the Edic, Marcy, New Scotland, and Rotterdam stations would be known as “Segment A” and the other projects would collectively be known as “Segment B”.<sup>4</sup>

The order directed the NYISO to consider transmission solutions satisfying a list of a key criteria, including that Segment A should increase Central-East interface capability by at least

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<sup>1</sup> See NYISO Open Access Transmission Tariff Section 31.4.11.

<sup>2</sup> See NYISO Market Services Tariff Section 30.4.6.8.5.

<sup>3</sup> The full text of the Public Policy Requirement is provided in Section III.

<sup>4</sup> The full text of the PPTN is provided in Section III.

350 MW and that Segment B should increase UPNY-SENY interface capability by at least 900 MW.<sup>5</sup>

Developers submitted 16 proposals for satisfying the PPTN. The NYISO found 13 that would satisfy the Viability and Sufficiency Criteria for Segment A and/or for Segment B. The NYISO performed a thorough analysis of the costs and benefits of these projects.

The NYISO estimated the overnight costs and assessed potential development risks of each project against the projected:

- Economic benefits from lower electricity production costs,
- Environmental benefits from reduced CO<sub>2</sub> emissions from fossil-fuel generators,
- Reliability benefits from helping satisfy planning resource adequacy requirements,
- The reduced need for fossil-fueled generation in downstate areas, and
- Other benefits from enhancing the bulk power system such as: expandability of new infrastructure, operability of transmission equipment, and retirement of aging equipment.

When evaluating the market effects of individual projects, we consider that uneconomic projects can harm the electricity markets by inefficiently altering energy and capacity prices in the short-term, crowding-out efficient market-based investment, and inflating market risks in the long-term. However, the determination of whether projects are economic must include factors that are not fully priced in the NYISO markets. Public policy projects that generate large unpriced benefits are more likely to be economic and, thus, are less likely to harm the markets. For projects that are uneconomic (i.e., whose costs exceed the priced and unpriced benefits they would produce), we consider the potential harm to the NYISO markets. This principle is discussed in more detail in Section II.A.

The remainder of this executive summary discusses our evaluation and conclusions. Section II provides a more detailed presentation of our evaluation, Section III provides the full text of the Public Policy Requirement and Transmission Need, and our conclusions are provided in Section IV.

### *Qualitative and Quantitative Evaluation Metrics*

The NYISO presented several quantitative and qualitative metrics of the market and reliability impacts and the investment costs of each project and outlined how these metrics were ultimately

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<sup>5</sup> These criteria may be found in: PSC Case No. 14-E-0454, *In the Matter of New York Independent System Operator, Inc.'s Proposed Public Policy Transmission Needs for Consideration, Order Finding Transmission Needs Driven by Public Policy Requirements* (December 17, 2015), Appendix B.

considered in its recommended selections.<sup>6</sup> While estimates of cost and economic value are relatively straight-forward, it can be difficult to evaluate metrics that are either qualitative or quantified in non-dollar terms. So, the following summarizes how we consider the diverse set of metrics and modeling results calculated by the NYISO or derived from its evaluation:

- **Environmental Benefits** – These include the value of CO<sub>2</sub> emissions abatement across New York, New England, Ontario, and PJM that would result from a proposed project.
- **Production Cost Savings** – These include reductions in fuel costs, variable O&M costs, and any other generator production costs (excluding CO<sub>2</sub> emissions allowance costs) across the same region.<sup>7</sup>
- **Capacity Market Benefits** – The capacity market provides a market-based mechanism for the NYISO to satisfy its planning reliability requirements. We divide the overall capacity market benefits into two sub-categories:<sup>8</sup>
  - **Generation Investment Cost Savings** – These also include the reduced cost of investment in generation necessary to satisfy the minimum resource adequacy planning standard.
  - **Reliability Benefits** – The economic value of more reliable service (than the minimum resource adequacy standard) can be inferred from how the projects affect the loss of load expectation (“LOLE”). We quantify the economic value of these reliability benefits based on the compensation that a generator would receive in the capacity market for providing comparable LOLE benefits.
- **Avoided Costs from Replacement of Aging Equipment** – When new transmission equipment replaces existing equipment, there are two types of potential cost savings. First, there is an O&M cost reduction that helps offset the O&M costs of the new equipment. Second, if the existing equipment is at the end of its useful life and needs to be replaced or otherwise refurbished, it would require capital expenditures that are made unnecessary by the new equipment.

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<sup>6</sup> The NYISO originally recommended Project T027 for Segment A and Project T029 for Segment B in the AC Transmission PPTP Report that was presented to the NYISO Management Committee in June 2018. After further consideration, the NYISO continues to recommend Project T027 for Segment A, but it now recommends Project T019 for Segment B. In this report, we refer to Projects T027/T019 collectively as the “recommended projects.”

<sup>7</sup> Differences between this quantity and production cost savings reported by the NYISO are discussed in Section II.C.1.

<sup>8</sup> Differences between our evaluation of Capacity Market Benefits and ICAP Savings reported by the NYISO are discussed in Appendix G to the AC Transmission PPTP Report: *Estimating Capacity Benefits of the AC Transmission Public Policy Projects*, memo to the NYISO Board of Directors. Our evaluation of Capacity Market Benefits is also discussed in Section II.C.1 of this report.

- **Reduced Need for Generation in Downstate Areas** – The primary rationale for the Public Policy Requirement (not including standard wholesale market objectives) was that it would reduce the need for generation in downstate areas. We estimate the amounts of installed capacity and electricity production in downstate areas (i.e., in Zones H, I, J, and K) that would be displaced by the new transmission projects.

We include the first four categories above in a single benefit-cost ratio, which provides the best overall measure of the economic value of a project relative to costs. The Reduced Need for Generation in Downstate Areas is reported separately (although it also accounts for a portion of the cost savings and the environmental and reliability benefits). Section II.C provides additional details about these quantitative metrics.

The NYISO also identified several qualitative benefits categories such as Operability, which it defines as: the extent that a given project affects flexibility in operating the system, such as dispatch of generation, access to operating reserves, access to ancillary services, or the ability to remove transmission for maintenance. Operability and some of the NYISO's other qualitative metrics are partly reflected in our estimated cost savings and reliability benefits metrics. Section II.C further discusses the use of these metrics.

#### *Summary of Assessment of Cost and Benefits for Recommended Projects*

Our review focuses on two scenarios that were evaluated by the NYISO:

- **Baseline Case**, which used assumptions from the 2017 CARIS study with several updates, including the retirement of the Indian Point nuclear plant; and
- **CES+Retirement Scenario**, which assumed that New York achieves the Clean Energy Standard ("CES") by constructing 16.2 GW of new renewable generating capacity and retiring the Indian Point nuclear plant, all coal-fired generation, and 3.5 GW of older peaking generation in downstate areas.

The Baseline Case reflects conditions that might be expected without significant public policy intervention by New York State, while the CES+Retirement Scenario reflects conditions if certain key policy initiatives are carried out. However, the specific policy assumptions used in the CES+Retirement Scenario were not laid out in the NYPSC Order directing the NYISO to evaluate solutions to its Public Policy Requirement. Hence, the NYISO had to exercise its judgement in developing the assumptions and constructing the CES+Retirement Scenario.

The following summarizes our assessment of the impact of the recommended projects:

*Overall Benefit-Cost Ratio.* Based on the combined Environmental, Economic, and Reliability benefits, we find an overall Benefit-Cost Ratio of 0.74 in the Baseline Case and 1.52 in the CES+Retirement Scenario over a 45-year period.

- Thus, the recommended projects are unlikely to be efficient or cost-effective without significant changes in the resource mix or additional transmission investments from public policy initiatives. Since the PSC Order did not identify the specific public policy objectives that the AC Transmission solutions were designed to satisfy, the NYISO had to make assumptions. While some assumptions can be traced back to an existing New York State law or regulation (e.g., the Clean Energy Standard), others cannot (e.g., retiring 3.5 GW of peakers in downstate areas).
- There is considerable uncertainty regarding the benefits from the recommended transmission projects because the benefits would depend on where renewable resources are placed to satisfy the CES. The NYISO assumed that 14 GW of land-based wind and utility-scale solar additions would be made outside Southeast New York (“SENY”) and that just 226 MW of offshore wind would be placed in downstate areas. However, after the NYISO’s study was underway, NYSERDA announced plans to solicit 2.4 GW of offshore wind in downstate areas by 2030, including 800 MW in 2018 and 2019. Increased offshore wind in downstate areas would reduce the need for renewables outside SENY to satisfy the CES. Hence, the recent shift in the planned placement of renewable generation (from upstream to downstream of the projects) would make the recommended projects less beneficial.
- Ultimately, it is difficult to know how sensitive the results are to particular assumptions since the NYISO did not run other CES-related scenarios. However, the recommended projects are more likely to be economic if large quantities of new renewable generation are sited west of the Central-East interface and the upstate nuclear units remain in service and/or additional transmission investments are made to relieve bottlenecks downstream of the recommended projects.

*Reducing Need for Generation in Downstate Areas.* The projects increase the transfer capability substantially over the UPNY/SENY interface, but will not result in large increases in power flows into SENY because of forecasted bottlenecks mostly downstream of these interfaces that are discussed below. The projects will:

- Increase transfer capability across the UPNY/SENY interface by 2,100 MW.
- Increase flows across UPNY/SENY by an average of just 229 MW in the Baseline Case and 271 MW in the CES+Retirement Scenario.
- Reduce the need for conventional generation in downstate areas by an average of just 145 MW in the Baseline Case. This amount rises to 300 MW in the CES+Retirement Scenario, but this is just 15 percent of the 2.0 GW of new conventional resources that will be needed by 2042 in the CES+Retirement Scenario.

- Hence, the recommended projects would offset just 4 percent of MWhs of generation and 2 percent of the installed generating capacity needs in downstate areas in the CES+Retirement Scenario.
- The benefits are limited in part by the prescriptive nature of the PPTN Order regarding the potential transmission solutions. A less prescriptive order would likely allow for transmission solutions that would be more effective at potentially lowering costs.

*Transmission Congestion Patterns* – The recommended transmission projects would relieve key transmission bottlenecks from central New York to the Hudson Valley, but other less severe bottlenecks would remain.

- The recommended projects significantly increase capability across the Central East interface (from Zone E to F) and the UPNY/SENY interface (from Zones E&F to G), which would significantly reduce transmission congestion across both interfaces.
- However, other less significant bottlenecks are forecasted to remain between Segments A and B (in Zone F) and on flows into New York City and Long Island from upstate (from Zone I to J and I to K).
- Ultimately, the recommended projects are configured in a way that satisfies a relatively small share of the energy and capacity needs that would result from retirements in downstate areas in the CES+Retirement Scenario (i.e., Zones H, J, & K).

#### *Observations Regarding the Public Policy Transmission Need Defined by the PSC*

The New York PSC ordered a Public Policy Transmission Need to build, upgrade, or retire specific transmission elements in four areas of the state. The PPTN was extremely prescriptive about the specific transmission solutions that the NYISO should solicit, so there was relatively little variation across the proposed solutions. If the PPTN had focused on the underlying public policy objectives rather than specifying the facilities to be upgraded, transmission developers would likely have been able to propose more efficient and cost-effective projects.

The NYISO’s study indicates that while Segments A and B significantly reduce transmission congestion, transmission bottlenecks south of Segment B still remain, suggesting that additional transmission may be needed for a “Segment C” from the Hudson Valley to New York City and/or Long Island to facilitate much larger flows into downstate areas. In its rationale for defining a PPTN involving specific upgrades in four distinct areas, the PSC order acknowledged the interdependence of new transmission projects in meeting its objectives:

The [PPTN] is for the entire portfolio...Segment A depends upon Segment B being in place, so Segment A would not be constructed without certainty that Segment B would be constructed. Segment B depends upon certain specified add-ons being in place, so

Segment B would not be constructed without certainty that the specified add-ons would be constructed.<sup>9</sup>

If a “Segment C” is needed in order to capture the full benefits of the projects in this study, it would be more cost-effective to perform a single comprehensive assessment that takes into account the interdependencies of the different segments.

### *Comments on Modeling Assumptions and Aspects of the PPTP Process*

This report also discusses aspects of the public policy transmission project (“PPTP”) evaluation process that may be important to enhance in future PPTP processes. Ultimately, if these factors were addressed, it would affect the overall conclusions regarding the cost-effectiveness of the recommended projects. Section II.D discusses these factors in greater detail.

### *Conclusion*

The recommended projects fulfill the Public Policy Requirement that was defined by the PSC. However, the Public Policy Requirement defined a specific set of recommended projects rather than the underlying public policy objectives. The recommended projects increase transfers from upstate to downstate, but only by a modest amount. Even in the CES+Retirement Scenario, the recommended projects offset only 4 percent of generation and 2 percent of installed capacity requirements in downstate areas.

We assess whether the recommended projects would adversely affect the market by undermining wholesale market prices and/or crowding-out more efficient investment.

- Under the Baseline Case (which does not consider major renewable generation additions to achieve public policy objectives), the recommended projects would not satisfy a basic cost-benefit test, raising concerns that the recommended projects would adversely affect the wholesale electricity markets.
- Under the CES+Retirement Scenario, the recommended projects clearly satisfy a basic cost-benefit test because of the increased value of transfers to downstate areas from low-emitting, low-variable cost resources in upstate New York. However, the benefits from the projects would be sensitive to the locations of particular resources that will be used to satisfy the Clean Energy Standard. For instance, if the PSC relies more on offshore wind rather than renewable generation upstate, it would reduce the benefits from the recommended transmission projects.

In addition, we recognize that our benefit-cost assessment does not capture certain unquantified benefits that would result from the projects. First, potentially significant benefits would be

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<sup>9</sup> See PPTN Order, Appendix A.

realized if additional transmission investments are made to increase transfer capability downstream of the recommended projects. Second, the recommended projects would provide increased operational flexibility because the series compensation can be bypassed.

Ultimately, the economic benefits of the recommended projects are limited by prescriptive requirements in the PPTN order and the fact that the projects terminate in the Hudson Valley (Zone G). In future public policy transmission processes, it would be beneficial to define requirements based on the underlying public policy objectives. This would allow developers the flexibility to propose projects that would produce the largest benefits at the lowest costs.



## II. EVALUATION THE MARKET EFFECTS OF PUBLIC POLICY PROJECTS

### A. Principles for the Evaluation of Market Effects

The purpose of the PPTP process is to identify transmission investments that would provide significant public policy and wholesale market benefits, but which would not move forward based on the other planning processes and/or market incentives for transmission. However, it is critical for the PPTP process to function in a manner that supports the NYISO's competitive wholesale markets. This section discusses the principles we use for evaluating the qualitative and quantitative benefit metrics against the estimated costs of proposed projects, and ensuring that the PPTP process does not undermine the wholesale market.

Transmission upgrades can provide many wholesale market and public policy benefits to the system. Additional transmission capability can:

- Increase the utilization of low-cost generation, which lowers production costs; and
- Satisfy public policy objectives, such as reducing environmental emissions by facilitating increased development and dispatch of lower-emitting resources.

Therefore, to assess the value of a proposed transmission project, it is important to fully quantify these benefits to determine whether the project is economic.<sup>10</sup> The NYISO's economic transmission planning process (CARIS) does not consider several key wholesale market benefits (not to mention public policy benefits). This is partly why no transmission project proposal has ever been deemed to be cost-effective under CARIS. The PPTP process allows the NYISO to consider additional benefits for a more complete assessment of whether a proposed project is truly economic.

In Section II.C of this report, we discuss a framework for quantifying the different categories of wholesale market and public policy benefits. This framework incorporates cost savings, reliability benefits, and environmental benefits into a single metric that assists in evaluating the impact on wholesale electricity markets from the proposed projects. Section II.C.2 provides the results of this benefit-cost metric for the recommended projects.

Although reducing wholesale market congestion will always produce benefits, these benefits must exceed the costs of the transmission project to conclude that the project is economic. Uneconomic transmission investment can inefficiently reduce wholesale prices, crowd-out efficient private investment, and ultimately increase the cost of satisfying public policy objectives. Therefore, our criteria for determining that a public policy transmission project is

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<sup>10</sup> We recognize that some of the public policy benefits are subjective and may not be quantified easily.

economic for purposes of this evaluation is: *the priced and unpriced benefits of the project exceeds its costs.*

Projects that do not satisfy this general principle will harm the markets and ultimately raise costs to consumers in New York. Therefore, we evaluate the costs and benefits of each of the proposed projects, which includes a review of the assumptions used to estimate the projects' benefits. We then apply this principle to determine whether the project recommended for selection by the NYISO would adversely affect the NYISO's wholesale electricity markets.

As a general matter, projects are more likely to be economic if the PPTN is defined in a manner that is focused on the ultimate public policy objective, and are not unnecessarily prescriptive. To the extent that the PPTN requires specific characteristics for the transmission solutions, it will likely foreclose opportunities for the most efficient proposals to come forward in the PPTP process. For example, rather than specifying the amounts and locations of additional transmission desired to achieve a public policy objective, it would be better for the PPTN to specify the ultimate objective as well as any key project constraints driven by siting issues and other considerations. This would allow developers to propose more creative and cost-effective solutions. Section II.B discusses the Public Policy Requirement and the related PPTN that were defined by the PSC and that determined the scope of this PPTP study.

Finally, although there is substantial overlap, these principles and metrics for evaluating market effects are not the only factors considered by NYISO in selecting a recommended project. The NYISO considers other qualitative factors that are not fully reflected in the benefit-cost evaluation. These are discussed in Section II.C.3.

### **B. Comments on the Public Policy Transmission Need Defined by the PSC**

In accordance with FERC Order 1000, the NYISO tariff allows for recovery of the costs of transmission projects that are built to achieve public policy requirements from New York State laws or regulations. In December 2015, the NYPSC issued an order finding a Public Policy Requirement to build "...a portfolio of 345 kV transmission projects to reconfigure and upgrade transmission facilities [involving ten specific substations in Zones E, F, and G.]" The order went on to define the PPTN, which provided additional specifics about the upgrades that were directed at the ten substations.<sup>11</sup>

While the Public Policy Requirement identified a long list of standard wholesale market objectives, such as cost savings and reliability, it also identified several objectives that are outside the ordinary scope of the wholesale market including: serving more load in downstate areas from efficient and/or renewable resources upstate, promoting job growth, increasing tax receipts, and reducing generation with harmful environmental and health effects. In Section II.C

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<sup>11</sup> The full texts of the Public Policy Requirement and the PPTN are provided in Section III.

of this report, we provide a benefit-cost metric that incorporates the benefits related to standard wholesale market objectives as well as environmental benefits from reducing CO<sub>2</sub> emissions. While this report does not evaluate whether the recommended projects provide net benefits related to job growth and increased tax receipts, we summarize the extent to which the new projects satisfy the objective of serving downstate areas with resources from upstate resources, which provides some indication of any additional environmental and health benefits.

The Public Policy Requirement and the PPTN provided limited details about the specific policy objectives that would be served by the new transmission projects, but they were very prescriptive about the particular transmission solutions that were to be solicited by the NYISO. This had several key implications for the NYISO's PPTP study.

First, since the PPTN lacked specifics about the location, characteristics, and quantity of renewable generation in upstate areas that was to be made deliverable to downstate areas, the NYISO had to make speculative assumptions. The NYISO's CES+Retirement Scenario assumed 14 GW of new land-based wind and solar in Zones A to F, just 226 MW of offshore wind, and no energy storage.<sup>12</sup> These assumptions were based on the NYS Department of Public Service staff whitepaper on the Clean Energy Standard published in January 2016.<sup>13</sup> However, after the NYISO's study was underway, the state announced plans to satisfy its policy objectives with 2.4 GW of offshore wind and 1.5 GW energy storage in downstate areas, which would require fewer renewable resources in upstate areas.<sup>14</sup> Hence, it is unclear whether the PPTP study included a realistic CES policy scenario.

Second, the PPTN also lacked specifics about the policy-related retirements that should be facilitated by the new transmission. The NYISO's CES+Retirement Scenario assumed 5.7 GW of retirements in Zones H, J, and K, including the Indian Point nuclear plant and 3.5 GW of older peaking units.<sup>15</sup> There is speculation that these older peaking units without back-end emissions controls will be phased-out by a forthcoming DEC rule. However, this information was not available to developers when they submitted proposed transmission solutions. Consequently, the proposed transmission solutions facilitate a relatively modest amount of increased flows from upstate to downstate areas partly because of bottlenecks downstream of the proposed projects. Ultimately, developers could have proposed more efficient and cost-effective projects if the PPTN included specifics about key policy-related retirements.

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<sup>12</sup> See Table 3-4 of the AC Transmission Public Policy Transmission Planning Report.

<sup>13</sup> See PSC Case No. 15-E-0302, staff whitepaper filed January 25, 2016.

<sup>14</sup> For example, see <https://www.greentechmedia.com/articles/read/new-york-throws-political-weight-behind-offshore-wind-and-energy-storage#gs.f8fOSZc>

<sup>15</sup> See page 48 of the AC Transmission Public Policy Transmission Planning Report.

Third, the Public Policy Requirement and the PPTN were unnecessarily specific about the particular transmission upgrades that would satisfy the underlying public policy objective. It is likely that this constrained the creativity of transmission developers in crafting proposals that would be most efficient and cost-effective.

### C. Framework for Integrating Qualitative and Quantitative Metrics

The NYISO presented several quantitative and qualitative metrics of the impacts and costs of each project and outlined how these metrics were ultimately considered in its recommended selection of Projects T027 and T019. While estimates of cost and economic value are relatively straight-forward to interpret, it can be difficult to evaluate metrics that are either qualitative or quantified in non-dollar terms. This section discusses: (a) our approach to quantifying the economic, environmental, and reliability benefits which were the basis for the PPTN; and (b) our comments on other metrics that the NYISO uses to assess each project.

#### 1. Cost Savings and Environmental and Reliability Benefits

The NYISO employed a diverse set of metrics for satisfying the PPTN, which can be used to derive the economic, environmental, and reliability benefits that would come from the recommended transmission projects.

*Environmental benefits* – A potential environmental benefit from proposed transmission projects is that they would allow zero-emission and relatively low carbon-intensity generation in upstate areas to offset the need for high carbon-intensity generation in downstate areas. However, new transmission would also affect CO<sub>2</sub> emissions over a wider region. The NYISO estimated the value of CO<sub>2</sub> emissions reductions using projected CO<sub>2</sub> allowance prices in Ontario, New York, New England, and PJM. These environmental benefits are reflected in the NYISO’s GE MAPS production cost savings only to the extent that the simulations treated CO<sub>2</sub> allowance prices as a cost of generation.<sup>16</sup> Our benefit-cost metric includes the environmental benefits of CO<sub>2</sub> emissions reductions regardless of whether they are priced under a cap-and-trade program.

*Production Cost Savings* – A key economic benefit from the proposed transmission projects is that they allow increased generation from sources with low variable costs, which displaces generation from higher-cost sources. This production cost savings is measured using GE MAPS

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<sup>16</sup> The NYISO’s Baseline Case assumed a federal CO<sub>2</sub> allowance program would be implemented in the fifth year of the study (i.e., 2027), so these benefits are not quantified in the production cost savings from the GE MAPS model from 2023 to 2026. However, in CES+Retirement Scenario, the NYISO assumed no federal CO<sub>2</sub> emission pricing program for the entire study period.

software.<sup>17</sup> This category does not include reductions in CO<sub>2</sub> allowance costs because those are categorized as environmental benefits.

We calculate the economic and environmental benefits of the recommended projects based on GE MAPS simulations performed by the NYISO. The following examples illustrate how we calculated the economic and environmental benefits from the GE MAPS simulations:

- Example 1 – A NY generator with fuel and variable O&M costs equal to \$2/MWh and no emissions increases output by 1 MW, while a NY generator with fuel and variable O&M costs equal to \$20/MWh and emissions costs of \$8/MWh decreases output by 1 MW.
  - Environmental Benefit = \$8 = \$8 reduction of allowance costs minus \$0 increase
  - Economic Benefit = \$18 = \$20 reduction of fuel/VOM costs minus \$2 increase
  - GE MAPS Production Cost Savings = \$26 = \$28 reduction of generator costs minus \$2 increase = Environmental Benefit + Economic Benefit
- Example 2 – A NY generator with fuel and variable O&M costs equal to \$2/MWh and no emissions increases output by 1 MW, while a PJM generator with fuel and variable O&M costs equal to \$20/MWh and emissions costs of \$8/MWh decreases output by 1 MW.
  - Environmental Benefit = \$8 = \$8 reduction of allowance costs minus \$0 increase
  - Economic Benefit = \$18 = \$20 reduction of fuel/VOM costs minus \$2 increase
  - GE MAPS Production Cost Savings = \$18 = \$20 reduction of import costs minus \$2 increase < Environmental Benefit + Economic Benefit

While our environmental and economic benefits are the same for Example 1 and Example 2, the GE MAPS Production Cost Savings would not be the same for Example 2. This is because if there is no CO<sub>2</sub> pricing regime in the neighboring area (which was assumed to be the case for most of PJM in the CES+Retirement Scenario), the production costs savings would exclude the value of emission reductions in such areas.

Lastly, we make four adjustments to the production cost savings drawn from the GE MAPS simulations. The first adjustment is designed to account for transmission outages and unexpected events that affect production costs in market operations (see Section II.D.1). The second adjustment is designed to account for the NYISO's assumption that new entry of generation will not occur until necessary to prevent the LOLE from rising above 0.1 days per year, while the capacity market is designed to induce new entry when there is still some surplus (see Section II.D.2). Third, we include production cost savings in years 21 to 45 of the project life, estimating them to be equal to the average annual production cost savings in years 1 to 20.

<sup>17</sup> Note, NYCA Production Costs measure changes in net import charges to NYCA, but this may not be equal to the change in production costs of generators on the other side of the border. Nonetheless, we believe that the changes in net import charges are a reasonable proxy for changes in production costs in neighboring areas.

Fourth, GE MAPS does not explicitly consider the cost of scheduling resources to satisfy the SENY operating reserve requirement, so the production cost savings do not consider the effects of raising the SENY reserve requirement from 1,300 to 1,750 MW if Projects T027/T019 are brought in service. To account for this, we reduced the production cost savings for Projects T027/T019 by 25 percent of the production cost savings differential between Projects T027/T019 and Projects T027/T029. However, the magnitude of this adjustment was very small, amounting to 0.1 percent of the production cost savings in the CES+Retirement Scenario and 3 percent of the production cost savings in the Baseline Case.

*Capacity Market Benefits – Generation Investment Cost Savings* – An important economic benefit from the proposed transmission projects is that they would reduce the need to build and/or maintain installed capacity to satisfy minimum planning criteria for resource adequacy and inter-zonal transmission security, particularly capacity in downstate areas where investment costs are generally higher.

We estimate the investment cost savings from the recommended projects based on how they would affect the Compensatory MWs necessary to satisfy the resource adequacy standard (i.e., 0.1 LOLE). The following example illustrates how we calculated this type of economic benefit:

- Suppose that in the base case, 400 MW of Compensatory MWs would be needed in Zone J to maintain LOLE below 0.1 in particular year, while in the project case, upstate capacity would be more deliverable to downstate loads, so that the LOLE could be maintained below 0.1 with Compensatory MWs of 300 MW in Zone C and 50 MW in Zone J.<sup>18</sup>
  - Investment Cost Savings in Zone J in one year = \$62 million = (400 MW – 50 MW) × Net CONE of \$177/kW-year
  - Investment Cost Increase in Zone C in one year = \$30 million = 300 MW × Net CONE of \$100/kW-year
  - Net Investment Cost Savings in one year = \$32 million = Investment Cost Savings in Zone J minus Investment Cost Increase in Zone C<sup>19</sup>

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<sup>18</sup> The Compensatory MWs information for the recommended projects was provided for each year of the evaluation by the NYISO.

<sup>19</sup> For the purposes of calculating the investment cost savings, we exclude the property taxes from the net cost of new entry. This is because we also excluded property taxes from the lifecycle costs of the recommended transmission projects as well as the aging transmission facilities that would be retired because of the new transmission. In general, increased property tax receipts are not a net benefit from a societal point of view. After removing the property contribution, we used Net CONE estimates of \$94/kW-year for Zone C, \$139/kW-year for Zone H, \$168/kW-year for Zone J, and \$115/kW-year for Zone K in 2018 dollars.

- The net present value of the Net Investment Cost Savings is calculated over an assumed 45-year project life cycle, using the net investment cost savings from the last year of the evaluation period to estimate savings in years 21 to 45.<sup>20</sup>

Capacity Market Benefits – Planning Reliability – This metric captures the market value of more reliable service (than the minimum resource adequacy standard requires) as additional reliability is valued in the installed capacity market. These benefits are best measured by how the projects affect the loss of load expectation (“LOLE”). We quantify this based on the compensation that a generator would receive in the capacity market for providing comparable LOLE benefits.<sup>21</sup>

We estimate the reliability benefits from the recommended projects to the extent that they improve the NYCA LOLE in each year of the study. These value of improved LOLE is consistent with the compensation to generation resources in the capacity market. Based on our evaluation of the capacity demand curves and locational capacity requirements for the 2018/19 Capability Year, we estimate that generating resources are paid \$2.9 million per 0.001 change in the LOLE per year.<sup>22, 23</sup> The following example illustrates how we calculated these benefits:

- Suppose that in the base case for a particular year, the LOLE is 0.08 days per year, while in the project case for the same year, the LOLE is 0.06 days per year.

<sup>20</sup> This metric is similar to the NYISO’s ICAP Savings metric, which is discussed in Section 3.3.8 of the AC Transmission Public Policy Transmission Planning (“PPTP”) Report. However, the NYISO’s ICAP Savings metric is generally higher because it is based on the assumption that the system is at the minimum resource adequacy requirement of 0.1 LOLE in both the base case and the project case in every year of the evaluation (regardless of the LOLE in the actual base case and project case for the year). Consequently, the NYISO’s ICAP Savings metric over-estimates the amount of generating capacity investment costs that would be reduced by the proposed projects. For additional discussion of the NYISO’s ICAP Savings metric, see Memorandum titled *Estimating Capacity Benefits of the AC Transmission Public Policy Projects* to NYISO Board of Directors from David B. Patton and Pallas LeeVanSchaick, dated November 8, 2018, which is Appendix G of the AC Transmission PPTP Report.

<sup>21</sup> Transmission can improve reliability in a variety of ways, including improving transmission security and the robustness of the system in general, as well as by improving resource adequacy by making resources more deliverable and able to be deployed when system contingencies occur. A substantial share of these reliability benefits translate into cost reductions, which are reflected in our Economic Benefit metrics that reflect production cost savings and generation investment cost savings.

<sup>22</sup> See *2017 State of the Market Report*, Section VII.D.

<sup>23</sup> As noted in footnote 17, we exclude the effects of property taxes from other elements of the benefit-cost ratio because increased property tax receipts are not a net benefit from a societal point of view. Accordingly, we exclude property taxes from the lifecycle costs of the recommended transmission projects, new generating capacity, and aging transmission facilities that would be retired because of the new transmission. Since the estimated capacity payments to generation of \$2.9 million per 0.001 change in the LOLE per year are derived from the net cost of new entry, we removed the contribution of property taxes from the estimated value of reliability benefits. After excluding property taxes, the estimated value is \$2.7 million per 0.001 change in the LOLE per year.

- Reliability Benefit in one year = \$58 million =  $(0.08 - 0.06 \text{ days per year change in the LOLE}) \times \$2.9 \text{ million per } 0.001 \text{ days per year change in LOLE}$ .
- The net present value of the retirement benefits is calculated over an assumed 45-year project life cycle, using the benefits from the last year of the evaluation period to estimate savings in years 21 to 45.<sup>24</sup>

*Avoided Costs from Replacement of Aging Equipment* – When new transmission equipment replaces existing equipment, there are two types of potential cost savings. First, there is an O&M cost reduction that helps offset the O&M costs of the new equipment. Second, if the existing equipment is at the end of its useful life and needs to be replaced or otherwise refurbished, it would require capital expenditures that would be rendered unnecessary by the new equipment. For the recommended projects, the NYISO and its consultant SECo identified specific transmission facilities that would be decommissioned as a result of the recommended projects.<sup>25</sup>

For all facilities that were removed from service, we estimated the reduction in O&M costs, assuming an annual O&M cost of 2.85 percent of the overnight cost of installing similar equipment, and calculating the net present value over an assumed 45-year project life cycle.<sup>26</sup> We used the same method to estimate the O&M costs of the new equipment.

For existing equipment that would need to be replaced or refurbished in the foreseeable future, we estimated the net present value of avoided capital expenditures. We assume that if the recommended projects were not installed, it would be necessary to: (a) fully replace all but 12.6 miles of each of the two Porter-to-Rotterdam 230kV lines, (b) replace the transmission lines (but

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<sup>24</sup> LOLE information for the recommended projects was provided for each year of the evaluation by the NYISO.

<sup>25</sup> These include: two 230kV lines from Edic (near Porter) to Rotterdam, one double-circuit 115kV line from Knickerbocker to Churchtown, two double-circuit 115kV lines from Churchtown to Pleasant Valley, the Churchtown 115kV substation, some equipment at the Rock Tavern substation, a double-circuit 138kV line from Shoemaker to Sugarloaf, 6.3-mile section of the Marcy to New Scotland 345kV line, a 13.4-mile section of the Princetown to New Scotland 115kV line, and the Rotterdam 230kV substation. See Section III for decommissioning required by the PPTN, and see *AC Transmission New York Public Policy Transmission Need, Technical Review Report*, Revision 8, by SECo (“SECo Report”), Section 4.10, for a list of facilities that would be decommissioned by individual projects.

<sup>26</sup> The DPS filed materials using 2.85 percent of overnight costs as an estimate for O&M in the AC Transmission PPTN proceeding. See slides 46 and 112 of the Brattle Group’s September 15<sup>th</sup> 2015 presentation on *Benefit-Cost Analysis of Proposed New York AC Transmission Upgrades*.

We estimated the overnight cost of similar equipment using the following assumptions: \$4.0 million per mile for a double-circuit 345kV line, \$3.4 million per mile for a 345kV line, \$3.2 million per mile for a 230kV line, \$2.5 million per mile for a double-circuit 115kV line, \$2.2 million per mile for a 115kV line. For projects that would mount new lines on existing towers, we assumed a 0.4 cost multiplier. For the equipment to be replaced for the local upgrade facilities in Segment B, the decommissioning of two substations, and circuit breakers, we assumed an overnight cost of similar equipment at \$100 million.

not the transmission towers) for 12.6 miles of the same facilities; and (c) fully replace 87 miles of 115kV double-circuit 115kV lines between the Knickerbocker and Pleasant Valley substations.

The net present value of capital expenditures to rebuild or refurbish existing equipment depends on when the expenditures would have been incurred if the new transmission was not built, so there is a great deal of uncertainty about when that would be. For example, the STARS Phase II Study Report was published in April 2012, indicating that both Porter to Rotterdam lines should be replaced within ten years.<sup>27</sup> However, in an October 2012 report to the PSC, National Grid stated that it was planning to perform a condition assessment of these lines before determining the appropriate scope and schedule for refurbishment.<sup>28</sup> Ultimately, SECo and the proposers in the AC Transmission PPTP process found that 12.6 miles of existing towers for each circuit were in good condition and did not warrant replacing.<sup>29</sup> To account for some uncertainty in our benefit-cost estimate, we assumed that the Porter-to-Rotterdam equipment would have been replaced in 2025 and that the Knickerbocker to Pleasant Valley equipment would have been replaced in 2035.<sup>30</sup>

*Reduced Need for Generation in Downstate Areas* – The primary rationale for the Public Policy Requirement (not including standard wholesale market objectives) was that it would reduce the need for generation in downstate areas. We estimate the average reduction in generation in downstate areas based on the average increase in flows across the UPNY/SENY interface between the base case and the project case.<sup>31</sup> We also estimate the average reduction in the amount of generating capacity in downstate areas based on the difference in Compensatory MWs between the base case and the project case.<sup>32</sup>

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<sup>27</sup> See pages 33-35.

<sup>28</sup> See *Report on the Condition of Physical Elements of Transmission and Distribution Systems*, by National Grid, NY PSC Case No 06-M-0878, dated October 1, 2012, pages 12-14.

<sup>29</sup> See SECo Report, Section 4.10.1.

<sup>30</sup> In its work to support the DPS in the AC Transmission proceeding, Brattle Group assumed Porter to Rotterdam equipment would be replaced in 2020, but Brattle ran a sensitivity assuming the lines would not be replaced until 2030, acknowledging the uncertainty around such projections. Likewise, Brattle assumed the Knickerbocker to Pleasant Valley equipment would be replaced in 2030, but a sensitivity assumed this equipment would not be replaced until 2040. See Brattle Group's October 8, 2015 presentation *Benefit-Cost Analysis of Proposed New York AC Transmission Upgrades*, slides 34 & 43.

<sup>31</sup> See Section 3.3.6 of the AC Transmission Public Policy Transmission Planning Report.

<sup>32</sup> The Compensatory MWs are provided in Table 3-3 of the AC Transmission Public Policy Transmission Planning Report for 2042. The NYISO provided us with data for each year of the evaluation.

## 2. Evaluation of the Economics of the Proposed Public Policy Transmission Projects

We have reviewed modeling results for the recommended public policy transmission projects. Using these results and the project costs presented in the NYISO report, we calculated the economic, environmental, and reliability benefits for these projects and compared these benefits to the project costs. We include the project costs for the local upgrade portions of Segment B, since these are an integral component of the segment. Likewise, we include estimated O&M costs for the new recommended projects.

We calculate a net present value of \$1.99 billion for the overall cost over a 45-year period for Projects T027/T019.<sup>33</sup> Figure 1 summarizes the cost savings and other benefits from the recommended projects in the Baseline Case and the CES+Retirement Scenario relative to the project costs.

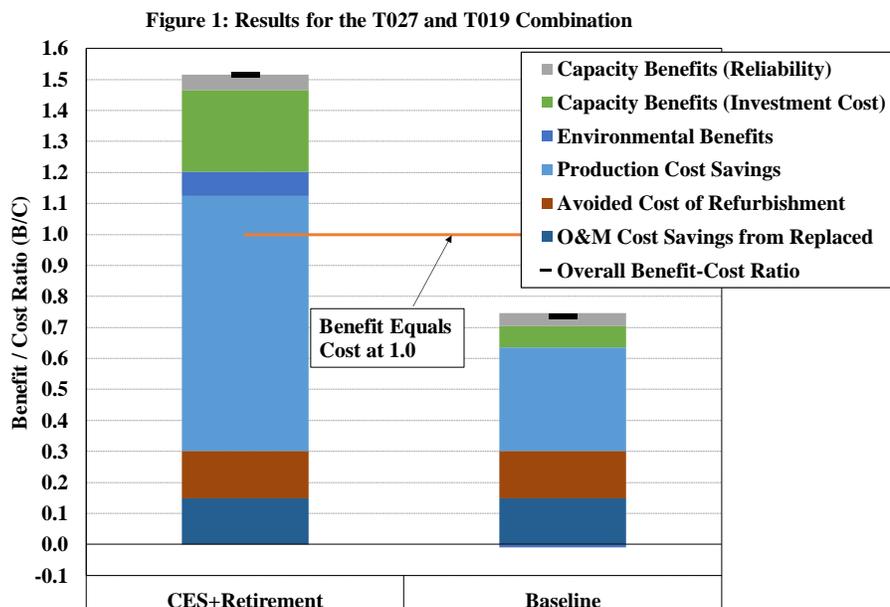


Figure 1 shows that the aggregate cost savings and other benefits we calculate are lower than the recommended projects' costs in the Baseline Case with a B/C ratio of 0.74. The overall cost savings and other benefits are substantially higher than the projects' costs in the CES+Retirement Scenario with a B/C ratio of 1.52.

Installation of the recommended projects would allow for the decommissioning of substantial quantities of existing equipment. Since we consider the O&M cost of the new equipment in the cost portion of the B/C ratio, we consider the reduction in O&M cost from equipment that is decommissioned as a benefit over the 45-year period. We also consider the avoided costs of not having to replace or refurbish older equipment, including 225 miles of existing high voltage lines. Together, these two categories account for a large component of the overall benefits with a net present value of \$600 million.

<sup>33</sup> For Projects T027/T019, the overall cost of \$1.99 billion includes \$1.23 billion overnight cost for the projects, \$113 million for the local upgrades, \$123 million for interest during construction and other financing costs, and \$521 million for the net present value of 45 years of O&M.

In both scenarios, a key benefit comes from lower production costs as the transmission projects would allow low-cost generation in western New York to displace higher-cost resources in eastern New York and New England. The CES+Retirement Scenario exhibits larger production costs savings (\$1.63 billion) than the Baseline Case (\$662 million) because the CES+Retirement Scenario includes much larger quantities of renewable generation outside SENY than does the Baseline Case.

Capacity benefits from investment cost savings are substantial in both scenarios as the transmission projects would reduce Compensatory MWs by 300 MW in Zone J in each year of the CES+Retirement Scenario (resulting in savings of \$524 million) and by up to 400 MW after 2033 in the Baseline Case (resulting in savings of \$136 million).

Capacity benefits from improved reliability are modest in the CES+Retirement Scenario because the proposed transmission projects reduce the need for generation in Zone J, but the overall LOLE is similar between the base case and project case because the project case assumes less generation investment. On the other hand, reliability benefits are higher in the Baseline Case because the recommended transmission projects lead to an improved LOLE from 2023 to 2033 (instead of reducing the need for investment in generating capacity).

These results indicate that the recommended projects would provide only modest environmental benefits from CO<sub>2</sub> emission reductions in the CES+Retirement Scenario and small negative environmental impacts in the Baseline Case. This pattern reflects that while the transmission projects would allow more low-emission resources in western New York to displace fossil-fueled generation in eastern New York and New England, this also leads to additional net imports from PJM, which has relatively high-emission intensity generation.

### 3. Other Quantitative Measures of Impact

The recommended projects increase the transfer capability substantially (2,100 MW) over the UPNY/SENY interface,<sup>34</sup> but will not result in large increases in power flows into SENY because of forecasted bottlenecks mostly downstream of these interfaces that are discussed below. The projects would increase flows across UPNY/SENY by an estimated average of just 229 MW in the Baseline Case and 271 MW in the CES+Retirement Scenario. Furthermore, the projects would reduce the need for conventional generation in downstate areas by an average of just 145 MW in the Baseline Case. This amount rises to 300 MW in the CES+Retirement Scenario, but this is just 15 percent of the 2.0 GW of new conventional resources that will be needed by 2042 in the CES+Retirement Scenario.<sup>35</sup>

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<sup>34</sup> See Table A-3 of the AC Transmission Public Policy Transmission Planning Report Addendum.

<sup>35</sup> The Compensatory MWs are provided in Table 3-3 of the AC Transmission Public Policy Transmission Planning Report for 2042.

The recommended transmission projects would relieve key transmission bottlenecks from central New York to the Hudson Valley, but other less severe bottlenecks would remain. The recommended projects significantly increase capability across the Central East interface (from Zone E to F) and the UPNY/SENY interface (from Zones E&F to G), which would significantly reduce transmission congestion across both interfaces. However, other less significant bottlenecks are forecasted to remain between Segments A and B (in Zone F) and on flows into New York City and Long Island from upstate (from Zone I to J and I to K).

#### 4. Qualitative Metrics

The NYISO identified several benefits categories that were qualitative in its evaluation, which included: “Performance,” “Operability,” and “Expandability.” The NYISO also identified project risks using qualitative designations. While these categories are inherently difficult to estimate, when interpreting the results, it is important to consider the extent to which these qualitative risks and benefits are reflected in the quantitative metrics.

*Performance.* Defined as how the proposed project may affect the utilization of the system. In the AC Transmission PPTP Report, this was based on the amount by which a project would increase flows from upstate to downstate over the Central East and UPNY/SENY interfaces. The estimated economic and environmental benefits of this performance is largely reflected in the GE MAPS simulations, so the qualitative assessment of Performance is not an entirely distinct benefit. However, these estimated benefits do not include the advantages from the enhanced performance that Projects T027/T019 would provide because they include bypassable series compensation.

*Operability.* The extent that a given project affects flexibility in operating the system, such as dispatch of generation, access to operating reserves, access to ancillary services, or the ability to remove transmission for maintenance. The NYISO considered how the proposed projects may affect the cost of operating the system, such as how they may affect the need for operating generation out of merit for reliability needs, reduce the need to cycle generation, or provide more balance in the system to respond to system conditions that are more severe than design conditions. The NYISO identified as superior projects that would provide greater ability to remove transmission facilities for maintenance or higher transfers under a N-1-1 contingency criteria. This operational flexibility is important during significant transmission outages or other changes in system conditions that are not considered in the GE MAPS estimates.

*Expandability.* Considers the impact of the proposed solution on future construction and the extent to which any subsequent expansion of the system will continue to use a proposed transmission project. The potential benefits of future expansion are not reflected in the NYISO’s quantitative metrics. Ultimately, it is difficult to forecast whether this expandability will be utilized in the future.

*PSC Criterion on Aging Infrastructure.* Project selection process also considered favorableness of the Public Policy Transmission Projects that result in upgrades to aging infrastructure, like retirement of existing substation, etc. The avoided cost of refurbishment to existing transmission facilities and reduced O&M costs from decommissioned facilities accounted for significant benefits in the AC Transmission Study. We discuss these benefits further in Section III.D.1.

*Permitting and other risks to the project timeline.* The permitting agency may require changes that increase the overnight or lifecycle costs, or it may not grant the use of certain rights of way. A project may take more time to develop than anticipated, which tends to increase project financing costs and reduces the net present value of benefits from the project. These risks were considered in the NYISO's estimated duration of development for each project.

#### **D. Key Assumptions Used to Estimate Benefits and Costs**

This section discusses key assumptions used in the NYISO's estimates of the costs and benefits of the proposed projects. We also discuss several factors that were not considered in the NYISO's estimates. Ultimately, we find that the overall effect of addressing these factors would likely be a modest increase in the overall benefit-cost ratios for the recommended projects.

These factors may become more important in a future PPTP process, so we recommend the NYISO consider addressing issues in future evaluations. Subsection 1 discusses the estimation of individual project costs. Subsection 2 addresses the NYISO's assumptions regarding retirements and new entry over the study period. Subsection 3 evaluates the assumptions used in the production cost simulation model.

##### **1. Factors Affecting Costs of Proposed Projects**

In accordance with its Tariff, the NYISO considered only the overnight capital costs of the proposed projects. The NYISO requested detailed project information from the developers, but it ultimately utilized an independent consultant to estimate the overnight costs of the proposed projects. While the NYISO's approach was reasonable in this evaluation, we recommend the following improvements in estimating project costs in future PPTP evaluations.

First, the NYISO's evaluation does not quantify non-capital costs such as O&M costs that would be incurred by proposed projects or aging infrastructure that is decommissioned, although these costs are significant. To illustrate, in the AC Transmission Proceeding, the Brattle Group estimated that the O&M costs for transmission projects typically add 39 percent to the net present value of the project's revenue requirement over a 45-year amortization period.<sup>36</sup> We

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<sup>36</sup> See slides 46 and 112 of the Brattle Group's September 15<sup>th</sup> 2015 presentation on *Benefit-Cost Analysis of Proposed New York AC Transmission Upgrades*. The Brattle Group utilized a spreadsheet provided by the DPS to estimate the O&M costs in its analysis. The NYISO posted the DPS spreadsheet at

included estimated O&M costs in our B/C ratio based on generic cost information, but we recommend that the NYISO estimate these costs as part of its evaluation in future PPTP evaluations.

Second, the NYISO's evaluation does not quantify the avoided cost of not having to refurbish aging infrastructure. In this study, these costs were quite significant, so we included estimates in our B/C ratio based on generic cost information, but we recommend that the NYISO estimate these savings as part of its evaluation in future PPTP evaluations.

Third, the NYISO in its evaluation did not utilize capital cost estimates that were submitted by the developers, and instead relied entirely on independent estimates provided by its consultant. Several developers have indicated that the NYISO's cost estimates are significantly different from their own estimates. For instance, one developer indicated that SECO's cost estimate for poles was 100 percent higher than its own estimate.<sup>37</sup> If developers were able to make firm offers and take on the risk of cost overruns related to their proposed projects, it would be reasonable and beneficial to rely on the developers' cost estimates. Unfortunately, this is not allowed under the current tariff and rules so utilizing an independent third party to develop an unbiased cost estimate is reasonable. However, the fact that this option is unavailable to the developers precludes an efficient assignment of risk and realization of the full benefits of competition for the ratepayers. Hence, it would be beneficial to develop tariff provisions that would allow developers to take this risk by guaranteeing their costs.

## 2. Assumptions for Resource Mix

A number of evaluation metrics considered by the NYISO (including production cost savings, performance, reduction in CO<sub>2</sub> emissions) are significantly impacted by the assumptions regarding the mix of resources in NYCA and neighboring regions over the study period. As discussed earlier, for the Baseline Case, the NYISO utilized the 2017 CARIS Phase 1 database with a number of updates. For the CES+Retirement Scenario, the NYISO used the zonal resource mix defined by the New York State Department of Public Service (DPS) for the State Resource Planning study in identifying where intermittent renewables were likely to interconnect, and the NYISO used its judgment in identifying which generators would retire. While it is reasonable to rely on the models and methodologies that have been developed in the NYISO's well-established economic transmission planning process (i.e., CARIS), we identify several assumptions that might be enhanced in future PPTP processes.

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[http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Public\\_Policy\\_Documents/AC\\_Transmission\\_PPTN/DPS\\_AC\\_Transmission\\_PVRR\\_Model.xls](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/AC_Transmission_PPTN/DPS_AC_Transmission_PVRR_Model.xls)

<sup>37</sup> See May 14<sup>th</sup> 2018 comments of NextEra Energy on Draft AC Transmission Public Policy Transmission Planning Report.

First, in all scenarios, the NYISO assumed that new entry of conventional resources would occur such that the system meets the minimum resource adequacy standard in each year of the study period (i.e., that LOLE does not exceed one day in ten years). However, the NYISO's capacity market is designed to incentivize investment to maintain a small excess capacity margin, so the average LOLE would not be expected to exceed 0.7 days per ten years.<sup>38</sup> Consequently, the NYISO's assumption leads to an unrealistically low capacity margin from 2034 to 2042 in the Baseline Case and for all 20 years of the CES+Retirement Scenario. The low capacity margin leads to inflated production cost savings, investment cost savings, and reliability benefits from the new transmission, which tends to overstate the overall benefit-cost ratio of the projects. To account for this, we reduced the production cost savings by 10 percent in our B/C ratio, but we recommend that the NYISO modify this assumption in future evaluations to be more consistent with the NYISO market design.

Second, other than the addition of Compensatory MWs, the NYISO's scenarios did not systematically consider how new transmission lines would affect future entry and exit decisions by generators. Thus, we recommend that the NYISO incorporate a model for entry and exit decisions of renewable and fossil-fuel generators and energy storage resources upstream and downstream of the constraint in its future PPTP assessments.<sup>39</sup>

Ultimately, if the NYISO implemented these two recommendations, it would make the estimated benefits less sensitive to the NYISO's assumptions regarding the status of any particular units. This is because the exclusion of particular generators would lead to new entry earlier in the study period, so the effects of these assumptions would be moderated significantly.

### 3. Production Cost Modeling Assumptions

Over the past decade, the NYISO has developed its production cost simulation models in the economic transmission planning process (i.e., CARIS), and the NYISO relied on these for evaluating proposed projects in this PPTP process. The NYISO utilized the GE-MAPS software to model the electrical system and estimate the production cost savings associated with the proposed projects. This was the primary model that was used to estimate economic and environmental benefits. While it is reasonable for the NYISO to rely primarily on the CARIS models, there are several modeling assumptions that could be modified in future PPTP processes to improve the accuracy of the estimated production cost savings.

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<sup>38</sup> See page 55 of the *2016 State of the Market Report for the New York ISO Markets* by Potomac Economics.

<sup>39</sup> It would be particularly important to incorporate an entry/ exit model when evaluating solutions to future PPTNs that are justified based on their ability to incent new (renewable or conventional) generation. This would likely require the NYISO to evaluate each project relative to prices and other conditions in the project case, which would differ from the current paradigm that measures benefits using a comparison of a project case to a base case without the project.

First, the current GE-MAPS model does not include transmission outages and unforeseen factors such as load forecast error that exacerbate congestion during actual market operations and, as such, does not fully capture the value of new transmission lines that may help mitigate the impact of such factors. Transmission outages drive a large share of congestion in market operations, especially in areas with renewable generation. For example, we have found that most export-congestion from the North Zone is caused by transmission outages.<sup>40</sup> Moreover, in the AC Transmission Proceeding, the Brattle Group report developed several ways of estimating how transmission outages and other unforeseen factors would affect actual market outcomes relative to what the GE MAPS model would simulate, including one that would scale-up the production cost savings estimates by 40 percent.<sup>41</sup> We accounted for this issue in our B/C ratio by incorporating the 40 percent adder. Considering such factors would significantly increase the estimated benefits of new transmission, we recommend that future production cost simulations incorporate such factors.<sup>42</sup>

Second, estimated production cost savings are greatly affected by forecasted prices for natural gas and emissions allowances. The NYISO's sensitivity analysis revealed that both factors have a considerable impact on the estimated production cost savings. New investments in gas pipelines, LNG infrastructure, and generation assets in New York and neighboring regions are likely to affect congestion in the gas system, forecasted gas price levels, and gas price spreads in the region. Further, natural gas pipeline congestion has been the principal driver of congestion in the NYISO market since 2012. Hence, quality gas price forecasts and sensitivities are essential for evaluating the cost-effectiveness of new transmission investments.

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<sup>40</sup> For a discussion of the transmission outages and related congestion patterns, see Appendix Section III.B of the *2016 State of the Market Report for the New York ISO Markets*.

<sup>41</sup> See slides 13-18 of the Brattle Group's October 8<sup>th</sup> 2015 presentation on *Benefit-Cost Analysis of Proposed New York AC Transmission Upgrades*.

<sup>42</sup> While the NYISO evaluated the reliability benefits from the proposed projects under various maintenance conditions as part of the Operability metric, this metric does not include a monetary valuation of the economic, environmental, and reliability impacts under maintenance conditions.

### III. TEXT OF THE PUBLIC POLICY REQUIREMENT AND TRANSMISSION NEED

In December 2015, the NYPSC issued an order finding the following Public Policy Requirement:

it is the public policy of the State of New York and the Public Service Commission: to reduce transmission congestion so that large amounts of power can be transmitted to regions of New York where it is most needed; to reduce production costs through congestion relief; reduce capacity resource costs; to improve market competition and liquidity; to enhance system reliability, flexibility, and efficiency; to improve preparedness for and mitigation of impacts of generator retirements; enhance resiliency/storm hardening; to avoid refurbishment costs of aging transmission; to take better advantage of existing fuel diversity; to increase diversity in supply, including additional renewable resources; to promote job growth and the development of new efficient generation resources Upstate; to reduce environmental and health impacts through reductions in less efficient electric generation; to reduce costs of meeting renewable resource standards; to increase tax receipts from increased infrastructure investment; to enhance planning and operational flexibility; to obtain synergies with other future transmission projects; and to relieve gas transportation constraints, in the balanced and cost-effective manner that would be accomplished by the construction and operation of a portfolio of 345 kV transmission projects to reconfigure and upgrade transmission facilities from the Edic or Marcy substations to the New Scotland substation with a tie-in to the Rotterdam substation and from a new Knickerbocker substation to the Pleasant Valley substation, with upgrades at the Greenbush substation, including also upgrades to the Rock Tavern substation, and the construction of a new double circuit 138 kV line from the Shoemaker to Sugarloaf substations (and as more specifically described in Appendix A attached hereto), and that such policies constitute Public Policy Requirements driving transmission needs.

The Commission also hereby finds that: the 2015 State Energy Plan, which contains adopted policies and long-range energy planning objectives and strategies, including fulfillment of the action items that constitute New York's Energy Highway Blueprint (implementation of a proposal to upgrade the transmission system being evaluated in the AC Transmission proceedings are one of the action items); Section 6-104(1) of the Energy Law which requires the State Energy Planning Board to adopt a State Energy Plan; and Section 6-104(5)(b) of the Energy Law which generally requires the Commission to make energy related actions or decisions that are reasonably consistent with the policies and long-range energy planning objectives and strategies contained in the State Energy Plan; together constitute Public Policy Requirements driving transmission needs.

Appendix A to the order stated that the Public Policy Requirement above leads to the following Public Policy Transmission Need:

#### SEGMENT A

Edic/Marcy to New Scotland; Princetown to Rotterdam - Construction of a new 345 kV line from Edic or Marcy to New Scotland on existing right-of-way (primarily using Edic to Rotterdam

right-of-way west of Princetown); construction of two new 345 kV lines or two new 230 kV lines from Princetown to Rotterdam on existing Edic to Rotterdam right-of-way; decommissioning of two 230 kV lines from Edic to Rotterdam; related switching or substation work at Edic or Marcy, Princetown, Rotterdam and New Scotland.

#### SEGMENT B

Knickerbocker to Pleasant Valley - Construction of a new double circuit 345 kV/115 kV line from Knickerbocker to Churchtown on existing Greenbush to Pleasant Valley right-of-way; construction of a new double circuit 345 kV/115 kV line or triple circuit 345 kV/115 kV/115 kV line from Churchtown to Pleasant Valley on existing Greenbush to Pleasant Valley right-of-way; decommissioning of a doublecircuit 115 kV line from Knickerbocker to Churchtown; decommissioning of one or two double-circuit 115 kV lines from Knickerbocker to Pleasant Valley; construction of a new tap of the New Scotland-Alps 345 kV line and new Knickerbocker switching station; related switching or substation work at Greenbush, Knickerbocker, Churchtown and Pleasant Valley substations.

Upgrades to the Rock Tavern Substation - New line traps, relays, potential transformer upgrades, switch upgrades, system control upgrades and the installation of data acquisition measuring equipment and control wire needed to handle higher line currents that will result as a consequence of the new Edic/Marcy to New Scotland; Princetown to Rotterdam and Knickerbocker to Pleasant Valley lines.

Shoemaker to Sugarloaf - Construction of a new double circuit 138 kV line from Shoemaker to Sugarloaf on existing Shoemaker to Sugarloaf right-of-way; decommissioning of a double circuit 69 kV line from Shoemaker to Sugarloaf; related switching or substation work at Shoemaker, Hartley, South Goshen, Chester, and Sugarloaf.

Notes:

The need is for the entire portfolio, but the portfolio lends itself to segmentation such that transmission solutions should be solicited in a manner that allows applicants to propose solutions either by segment or on a combined portfolio basis, or in the alternative on both bases. Segment A depends upon Segment B being in place, so Segment A would not be constructed without certainty that Segment B would be constructed. Segment B depends upon certain specified add-ons being in place, so Segment B would not be constructed without certainty that the specified add-ons would be constructed.

## IV. CONCLUSIONS

The NYPSC issued an order identifying a PPTN that would increase transmission flows from upstate areas to downstate areas. It directed the NYISO to consider solutions on four paths across the Central East and UPNY/SENY interfaces that would be expected to increase flows from low-cost and renewable generation upstate to loads in downstate areas. The NYISO, in accordance with the PPTP component of its comprehensive system planning process, evaluated 16 proposed projects that were proposed to address the PPTN. The NYISO published the Public Policy Transmission Planning report that summarizes the need, the proposed projects, V&S assessment, and the evaluation and selection of the most economic projects.

We reviewed the NYISO's report and evaluated the costs and benefits of the proposed projects in the context of assessing their effects on the NYISO markets. Based on this evaluation, we find that the NYISO's recommended projects will be economic if the Clean Energy Standard is satisfied with high levels of intermittent renewable generation upstate. However, if state policies shift more investment to offshore wind and energy storage in downstate areas, the benefits from the recommended projects will be reduced. Ultimately, the benefits of the recommended transmission projects are heavily dependent on the placement of new renewable generation and the locations of retiring generation.

In general, we found the NYISO's methodologies for this assessment are reasonable. However, we identify several methodological enhancements for NYISO to consider in future public policy transmission evaluations. Recommended enhancements are summarized in the following table.

**Table 1: Summary of Recommended Enhancements**

<b>Issue:</b>	<b>Section:</b>
<b>Consider incorporating additional priced and unpriced benefits of new transmission projects into a single B/C metric.</b>	II.C
<b>Estimate O&amp;M costs of new and decommissioned facilities.</b>	II.D.1
<b>Estimate the cost savings from avoided refurbishment of older facilities.</b>	II.D.1
<b>Develop tariff provisions to allow developers to take risk of cost overruns.</b>	II.D.1
<b>Model entry and exit decisions for generators in a manner that is consistent with the expected competitive market outcomes.</b>	II.D.2
<b>Consider transmission outages and other unforeseen factors in estimating production cost savings.</b>	II.D.3
<b>Enhance quality of natural gas and emission allowance price forecasts.</b>	II.D.3

## Appendix F – Frequently Asked Questions

# **Frequently Asked Questions: AC Transmission Public Policy Transmission Planning Report**

A Report by the  
New York Independent System Operator

**DRAFT**

June 19, 2018

## **1. What is the expected Electromagnetic Field (EMF) Levels for the NAT/NYPA Double Circuit Proposal (T027)?**

### **a. Background**

Developers did not provide calculated results of anticipated EMF levels in their submitted proposals. The NYISO engineering contractor, SECo, identified this as a potential concern, and the NYISO issued a Request For Information requesting for EMF study reports. Developers provided calculations to the NYISO in October 2017 that SECo checked for their reasonableness within the context of the EMF standards promulgated by the New York State Public Service Commission (PSC). SECo determined that the calculations provided by all Developers have a reasonable correlation to one another for similar arrangements, such as the base project proposals consisting of a new single circuit between Edic and New Scotland, and appear to be a good preliminary indication of the potential EMF levels. All results indicated that the existing circuits between Princetown Junction and New Scotland Substation (this corridor has the existing 345 kV lines #14 Edic – New Scotland and #18 Marcy – New Scotland, and 115 kV line #13 Rotterdam – New Scotland) exceed the PSC’s EMF standards, except for NAT/NYPA, which originally provided data indicating that project T027 met the EMF standards. The proposed designs improve the condition, but EMF levels are still reported to exceed the guidelines for all single circuit proposals. Proposal T027 claimed to reduce the EMF levels to just below the PSC’s EMF standards. This was attributed to the electromagnetic fields from the new double circuit configuration interacting with the existing circuits to provide an EMF cancelling effect and reducing the EMF levels at the edge of the ROW. Transmission line design including the structure and conductor configurations, heights of conductor attachments to structures, conductor spacing, and phasing of the conductors have significant effects on EMF levels and with careful design can be used to mitigate EMF levels. Due to the good correlation of NAT/NYPA’s results for the base single circuit design with the other Developers and consistency of their reports, it appeared that the results provided for the T027 double circuit design were likely within a reasonable degree of accuracy without performing further quantitative analysis. A full scale EMF study will be required for the selected project during detailed engineering and preparation of the Part B application for a certificate of environmental compatibility and public need under Public Service Law Article VII, and is therefore outside the scope of the NYISO evaluation process.

### **b. Study Results**

After reviewing the study results with the Developers and the stakeholders at meetings of the ESPWG/TPAS and receiving updated EMF studies from NAT/NYPA on May 23, 2018, the NYISO

requested SECo to complete an independent EMF study of T027. SECo completed a study utilizing PLSCadd software. Additionally, SECo's subcontractor, HVM Engineering, conducted a separate study using the EPRI EMF software. This study focused on the T027 proposal for the line segment between Princetown and New Scotland and calculated EMF levels at the three sections of the corridor where the ROW widths varied. The results of the independent studies indicated that the EMF levels for 13.4 miles of the line corridor is anticipated to exceed the PSC's EMF standards. Additionally, NAT/NYPA submitted revised results on June 6, 2018, recognizing an error in previous calculations. The updated EMF results indicate that T027 requires the least easement to mitigate EMF impacts among the Segment A proposals due to the proposed replacement of 6.3 miles of Line #14 Edic – New Scotland. Therefore, the results from the independent studies conducted by SECo and HVM Engineering do not change the report's project ranking and selection recommendation.

## **2. Segment B Structure Heights**

### **a. Why are pole heights for Segment B projects important?**

In its December 17, 2015 Order, the PSC makes several references to the importance of minimizing structure heights and specifically noted on page 43 "As to structure heights, the Commission will not mandate criteria to be applied by the NYISO, but all proposers of transmission solutions should be aware as they prepare their submissions that minimization of structure heights will be an important issue in the siting review process so applicants should be careful to not lock themselves into designs that could not later be approved. All applicants are encouraged to minimize the heights of the proposed structures while keeping them within the context of their 2015 proposals." Therefore, the PSC identified minimizing structure height as an important consideration in evaluating the transmission proposals.

### **b. How were pole heights for Segment B projects evaluated?**

NYISO engineering contractor, SECo, obtained PLSCadd models of each Developer's proposed design and compared the proposed structure heights to the existing structures that would be replaced to determine the relative height increases and decreases. The comparison of each Developer's design was based on the absolute difference between a proposed structure and the structure it would replace. While SECo checked to ensure Developers' designs met ground clearance standards, the designs were evaluated as proposed.

For projects T022 and T023 proposed by NextEra, the concrete pole section is 90 feet, and there is an additional steel section with the crossarms on top of the concrete poles. The structures total height above the ground is 92.5 feet. The review team does not believe that most of NextEra's structures can be shortened from the proposed design and still maintain NESC required ground clearance.

**c. Why didn't the ISO and its contractor SECo perform viewshed analysis?**

A viewshed analysis is considered detailed engineering that will be required for the Developer to complete in preparation of the Part B application for a certificate of environmental compatibility and public need under Public Service Law Article VII and is therefore outside the scope of the NYISO evaluation process. The PSC stated in its December 17, 2015 Order on page 42, *"The Commission is sympathetic to the suggestion of the NYTOs that projects have a positive impact on the community by reducing the total number of structures in a community from the number that exists today. At this stage, however, the NYISO would not have sufficient information to determine such impacts and the Commission does not want to convert the NYISO process into a siting process. Those matters will be further addressed by the Commission in the Article VII siting cases after the Part B construction information is filed. Similarly, structure heights are often dependent on specific decisions as to structure location and span length which are often influenced by the consideration of site-specific impacts to natural resources."*

Therefore, the PSC also did not intend that the NYISO conduct detailed siting-type studies such as a viewshed analysis.

**d. Why is structure height increase used as a distinguishing factor if the heights can be modified during the Article VII process?**

The Article VII process does provide the mechanism by which the PSC identifies and mitigates unacceptable visual impacts. While the December 17, 2015 PSC Order stated on page 35 that structure height increases of less than 25 feet *"will not create an adverse impact of a regional nature that would significantly impair the physical visual character of the Hudson Valley and its communities."* visual impact is subjective and open to debate before the PSC in an Article VII proceeding. The PSC order continues on to state that *"[a] change in structure types and structure heights of the types contemplated may have local, site specific visual impacts."* The PSC stated in its December 17, 2015 Order on page 42, *"The Commission is sympathetic to the suggestion of the*

*NYTOs that projects have a positive impact on the community by reducing the total number of structures in a community from the number that exists today. At this stage, however, the NYISO would not have sufficient information to determine such impacts and the Commission does not want to convert the NYISO process into a siting process. Those matters will be further addressed by the Commission in the Article VII siting cases after the Part B construction information is filed. Similarly, structure heights are often dependent on specific decisions as to structure location and span length which are often influenced by the consideration of site-specific impacts to natural resources.”*

Therefore, the NYISO cannot speculate on the outcome of the identification and mitigation of each projects’ potential adverse visual impacts in a PSC Article VII proceeding. Nevertheless, in its December 17, 2015 Order, the PSC makes several references to the importance of minimizing structure heights and specifically noted, on page 43, *“As to structure heights, the Commission will not mandate criteria to be applied by the NYISO, but all proposers of transmission solutions should be aware as they prepare their submissions that minimization of structure heights will be an important issue in the siting review process so applicants should be careful to not lock themselves into designs that could not later be approved. All applicants are encouraged to minimize the heights of the proposed structures while keeping them within the context of their 2015 proposals.”*

The NYISO reasonably effectuated the PSC’s intent and considered the risk to siting and project delay by evaluating projects, in part, based upon their relative tower height increase and decreases.

### **3. How is the cost estimated for installation of concrete monopoles?**

SECo’s subcontractor, Kenny Construction, has applied this unit cost methodology for many years and believes it to be a widespread industry practice. The unit pricing rate is based on Kenny’s experience.

There is significantly more incremental work involved in the installation of full length concrete poles as opposed to multi-piece steel poles. The costs for matting, access roads, traffic control, and QA/QC were estimated based on typical construction activities for steel pole construction and was applied consistently for all projects (steel and concrete) considering normal operations. The unit cost used for the installation cost of concrete poles includes the following incremental work not usually required on steel pole installations:

- A 75-ton crane to off load the concrete pole from the Valmont delivery truck at the entrance to the right of way to a heavy duty truck capable of navigating the right of way. Based on

Kenny's experience, an additional crane would be needed to off load the concrete pole at the structure location though the means and methods vary to be as efficient as possible during construction.

- Typically, steel poles are delivered from the lay down area directly to the site, off loaded with a front end loader, and erected with a 40-ton crane.
- Typically, one concrete pole is delivered at a time and off loaded by the crane. Whereas, two steel poles are delivered to the right of way then off loaded by a front end loader or derrick truck.
- Additional traffic control for off-loading areas along the right of way and public thoroughfares.
- An 80 to 100 ton crawler crane is required for use in the right of way to set the poles.
  - This is a much more expensive crane than the DOT example used in NextEra's comments.
  - The crane costs referenced by NextEra are for roadway work. SECo's experience indicates that crane rentals for this type of transmission line work costs \$335.00/hour for a 100-ton crane.
- The size of the crane and the typical weight of the concrete poles require additional and thicker matting and heavier duty construction roads with wider turning radius capable of supporting the heavier loads. An average cost for matting and access roads was included in each estimate line item for matting and was applied consistently for all projects (steel and concrete) considering normal operations including framing and stringing. Incremental matting cost is included in the installation cost for the heavier equipment loadings and larger work pad areas required for the concrete pole.
  - Normal construction will require 200 three ply mats whereas the heavier concrete poles installation will require 340 timber type mats.
  - NextEra states that matting is required in wetlands whereas matting required on Article VII projects are estimated to be much more extensive.
  - Normal work pads for steel construction are estimated to average 100 feet in length and the pads for full length concrete poles will be approximately 150 feet long. The steel poles have three sections. The base section can be set in place and the top

section framed on the ground and then the two remaining sections are set in place on the base section. Kenny has found this method of setting the steel pole in sections the most efficient method.

- QA/QC inspections for each of the concrete poles will need to be done at the off-loading area or along the right-of-way.
  - Typically the steel poles are inspected several at a time at the lay down area.
- There would be additional labor required to rig and set poles. Rigging and maneuvering poles ranging to a length up to 135 feet and weighing up to 62,000 pounds versus steel pole segments (steel poles typically include three segments no longer than 50 feet) up to 50 feet long and 16,000 pounds. The terrain and off road locations of these transmission corridors and congestion of the ROW with existing energized circuits adds complexity to maneuvering poles of this weight. A minimum of six workers is required for each concrete pole as opposed to three workers for each steel pole.
- More time consuming construction. A three-person crew can typically to install four steel structures in one day as opposed to a six-person crew installing two similar concrete structures in a day.

#### **4. How did the NYISO evaluate NAT/NYPA proposals for Rotterdam Substation with potential interference of existing gas pipelines?**

During the field review of the Rotterdam substation, NYISO engineering contractor, SECo, identified that the preferred proposed substation layout in the NAT/NYPA and ITC proposals would interfere with existing gas pipelines. Thereafter, the NYISO issued a Request for Information on how the Developers were proposing to address this issue. NAT/NYPA's response provided amplifying information on options to relocate the gas pipelines or move the substation location to the northeast to avoid the pipelines.

NAT/NYPA's original proposal as submitted to the NYISO provided the alternative designs, indicated that the designs were preliminary in nature, and expressed willingness to work with the incumbent utility to complete an acceptable design. NAT/NYPA stated in the proposal:

*Rotterdam - the proposal assumes the new 345 kV substation yard will be built in an area to the southwest of the existing 230 kV yard in an area that requires minimal relocation of existing lower voltage transmission lines. The cost of relocation has been included in the estimate. Another alternative considered is building a 345 kV yard on a*

*portion of the existing 230 kV yard. Bidders propose a new location for the Rotterdam 345 yard due to the lower estimated cost, and with the expectation that expanding the 230 kV yard to 345 kV would be much more difficult and require a longer schedule. However, Bidders will be willing to have the incumbent transmission owners build and own the Rotterdam 345 kV substation if necessary to implement the proposal in the most effective and cost efficient manner. Similarly, Gas Insulated Substation (GIS) equipment could be used to greatly reduce the footprint of the Rotterdam 345 kV substation and allow for construction on a smaller footprint on the Rotterdam site, but at a higher cost.*

NAT/NYPA's response to the NYISO's Request For Information did not alter its original proposal by providing alternative routes for the first time. Instead, the response provided additional detail on the routing alternatives noted in its original proposal. Moreover, section 31.4.8.1.6 of Attachment Y of the OATT contemplates a scenario where a Developer can supply the NYISO with routing alternatives such as those provided to the NYISO here. Specifically, "[t]he ISO will consider whether the Developer: (i) already possesses the rights of way necessary to implement the project; (ii) has completed a transmission routing study, which (a) identifies a specific routing plan with alternatives."

Here, NAT/NYPA presented viable routing options to mitigate the concern with the gas pipeline interference and indicated in the proposal a willingness to adapt the design of the Rotterdam Substation to the incumbent utility's needs. Accordingly, the NYISO reasonably evaluated the alternative routes and included mitigation costs in the independent cost estimates used in its ranking and selection. Specifically, SECo and the NYISO factored this issue into its evaluation and ranking by imputing a cost to address the pipeline relocation issue. Only a small section (length of approximately 1,500 feet) of the gas pipelines is affected, and the affected section can be relocated within existing National Grid property—*i.e.*, to the western edge of National Grid's property or to the east side of the proposed substation location internal to National Grid's property. Thus, the NYISO determined that the risk associated with the relocation of the gas pipelines is low.

Kenny Construction had another Granite subsidiary with expertise in gas pipeline construction review the proposed relocation. Kenny and its affiliate provided budgetary pricing and did not identify any significant issues in completing this work. The affected pipeline was constructed under an Article VII certificate and would be subject to an Article VII modification. Considering the line can be relocated within the National Grid substation site, SECo did not consider it to be a major obstacle.

Alternatively, the substation can be moved to the northeast of the proposed location to avoid the gas lines or a GIS station can be constructed in the northern 230 kV yard, which is proposed to

be abandoned in this project. These proposed alternatives would be analyzed in more detail during detailed engineering and licensing in conjunction with the NYSPSC and the incumbent utility. The PSC will have the ultimate decision in the Article VII process for the gas pipeline and new station location.

## **5. How is the Middletown Transformer replacement analyzed?**

As a component of NAT/NYPA's Segment B projects, NAT/NYPA propose to replace an existing transformer at the Middletown Tap, which is owned by Orange and Rockland Utilities, Inc. The NYISO studied the replacement of this transformer, among other elements, in a System Impact Study and determined that there would be no adverse system impacts.

While no detailed engineering has been completed, NYISO's engineering contractor, SECo, believes the replacement transformer can be installed in the existing substation. SECo relied on Google Earth images to determine the dimensions of the substation and existing equipment. The substation comprises a 345 kV structure to terminate the incoming 345 kV transmission line tap, a 345 kV breaker and a disconnect switch, a 138 kV breaker and a disconnect switch, 345 kV/138 kV transformer, 138 kV line terminal structure, and associated instrument transformers.

The existing transformer has a top continuous rating of 562 MVA (652 LTE and 746 STE). The replacement transformer will have a top continuous rating of 720MVA (836 LTE and 956 STE). There is approximately 60 feet of space between the 345 kV breaker and the 138 kV breaker terminals. There are also a set of 345 kV bus supports between the 345 kV breaker and transformer, and a set of 138 kV instrument transformers between the 138 kV breaker and transformer. The existing transformer dimension is approximately 29 feet wide by 22 feet deep. Conservatively, the replacement transformer is estimated to be 50 feet wide by 33 feet deep. SECo assumed the existing transformer and oil containment will be replaced and the 345 kV bus supports and instrument transformer will be relocated to new foundations integrated with the transformer foundation. Based on the foregoing review, SECo determined that there is more than adequate room to install the larger transformer. SECo further noted that during detailed engineering, the specification for the transformer can be developed to optimize the arrangement of coolers and ancillary equipment to minimize the depth of the transformer to ensure that the transformer would fit within the existing substation.

**6. What is the potential subsynchronous resonance (SSR) risk for the National Grid/Transco New York Energy Solution Segment B Proposal (T019)?**

T019 may pose a potential SSR risk to the operation of its facilities caused by interactions between the proposed 50% series compensation and nearby synchronous generators. The topology screening that was provided by National Grid/Transco is not sufficient to address the SSR issue due to the following reasons:

- a. Frequency scanning and electrical damping torque that are widely used to analyze SSR, was not provided.
- b. The topology screening was based on the Summer Peak load flow model. However, the worst case for SSR could occur during light load system conditions.
- c. If there is any negative electrical damping for any unit, the interaction between torsional mode and resonant frequency should be further studied.
- d. The power flow cases used by National Grid/Transco to perform the SSR screening are outdated, and do not include certain generators that have made significant efforts to interconnect and enter into service in the next few years.
- e. SSR could impact future generation proposing to interconnect near the series compensation and that could be impacted by SSR.

Transient torque may be induced on the generators in the vicinity by system disturbances, and could lead to a catastrophic event that could damage the generator-turbine shaft. Diagnosing such events requires highly specialized expert knowledge and technology. To prevent catastrophic events that damage the generator shaft, special protection schemes can be designed and installed on the generators in the vicinity, if necessary. Such significant SSR risk can be assessed by screening and performing a frequency scan analysis; however, it is difficult to fully anticipate other potential impacts to generator operation and maintenance.

In addition, over voltage could occur at nearby buses due to series compensation. Transient recovery voltages (TRV) and the rate of rise of transient recovery voltages (RRTRV) needs to be studied for circuit breakers. The circuit breakers should be capable of building sufficient dielectric capability fast enough to extinguish the arc during fault current interruption. The installation of series compensation would require extensive protection coordination.

## **Appendix G – Market Monitoring Unit Memo Re: Estimating Capacity Benefits**



## Memorandum

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**TO:** NYISO Board of Directors

**FROM:** David B. Patton and Pallas LeeVanSchaick

**DATE:** November 8, 2018

**RE:** Estimating Capacity Benefits of the AC Transmission Public Policy Projects

### A. Introduction

In the second quarter of 2018, the MMU reviewed the ISO’s AC Transmission Public Policy Report and published a report (“MMU Report”) evaluating the costs and economic value of the recommended projects (T027/29).<sup>1</sup> The MMU’s Report examined the estimated costs and benefits of the projects, including:

- production cost savings;
- environmental benefits;
- capacity market benefits; and
- avoided maintenance and refurbishment costs for existing transmission that would be replaced by the new projects.

We found that the capacity market benefits can be quite large when transmission enhancements reduce the need for generating capacity in constrained localities. After the NYISO Board of Directors reopened the selection of projects, NYISO staff requested that the MMU:

- a) Compare the capacity benefits for the recommended projects to an alternative pair of projects (T027/19), and
- b) Comment on the methodology and results of the NYISO’s estimates of the capacity benefits.

The next section of this memo addresses both requests. Appendix A summarizes the original benefit-cost assessment for the Recommended Projects that was provided in the MMU Report. Appendix B provides additional detail about the MMU’s method for estimating the capacity benefits of transmission and the results for the Recommended and Alternative Projects.

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<sup>1</sup> See <https://www.potomaceconomics.com/wp-content/uploads/2018/06/MMU-Report-on-AC-TX-Projects.pdf>

## B. Comparison of Methods for Estimating Capacity Market Benefits

The estimates of capacity market benefits produced by the MMU and the NYISO differ substantially, but these differences are not driven by fundamentally divergent perspectives about the nature of capacity market benefits. Rather, we conclude that the differences are explained primarily by assumptions related to the locations and quantities of new entry and retirement over the coming decade and how these will affect transmission flows and the locations of network bottlenecks. This section discusses the different methodologies and key factors driving the different estimates.

The following table summarizes the net present value of capacity market benefits of the Recommended Projects (T027/29) and Alternative Projects (T027/19) over the first 20 years of project life.<sup>2</sup> The table shows the MMU’s estimates based on the Baseline Scenario and the CES + Retirement Scenario from the NYISO’s AC Tx Study. It also shows the NYISO’s estimates using the LCR Optimizer model.

(in millions)	MMU w/Baseline Scenario	MMU w/CES+Retire Scenario	NYISO Optimizer
<b>Recommended Projects</b>	\$218	\$523	\$584 to \$816
<b>Alternative Projects</b>	\$237	\$592	\$744 to \$1,040
<b>Differential</b>	\$19	\$69	\$160 to \$224

Given the wide variation in estimated benefits, we evaluated key factors that differed among the three estimates. First, the methodologies for quantifying the benefits are slightly different. The two MMU estimates combine:

- a) the investment cost savings from reduced need to build and maintain generating capacity, and
- b) the value of improved reliability.

The improved reliability is quantified based on compensation generators would receive in the capacity market for providing reliability benefits comparable to the transmission project. In contrast, the NYISO’s Optimizer calculates the estimated reduction in capacity payments by consumers from each project.<sup>3</sup> *We found this difference in methodology accounted for a small amount of the difference.*

The most important factor that explains the difference in capacity benefits is the assumed changes in supply that affect the transmission flows and bottlenecks in New York. The two

<sup>2</sup> The Appendices of this memo and the MMU Report assume a 45-year project life, but this memo provides estimates based on a 20-year life for easier comparison to the NYISO’s estimates.

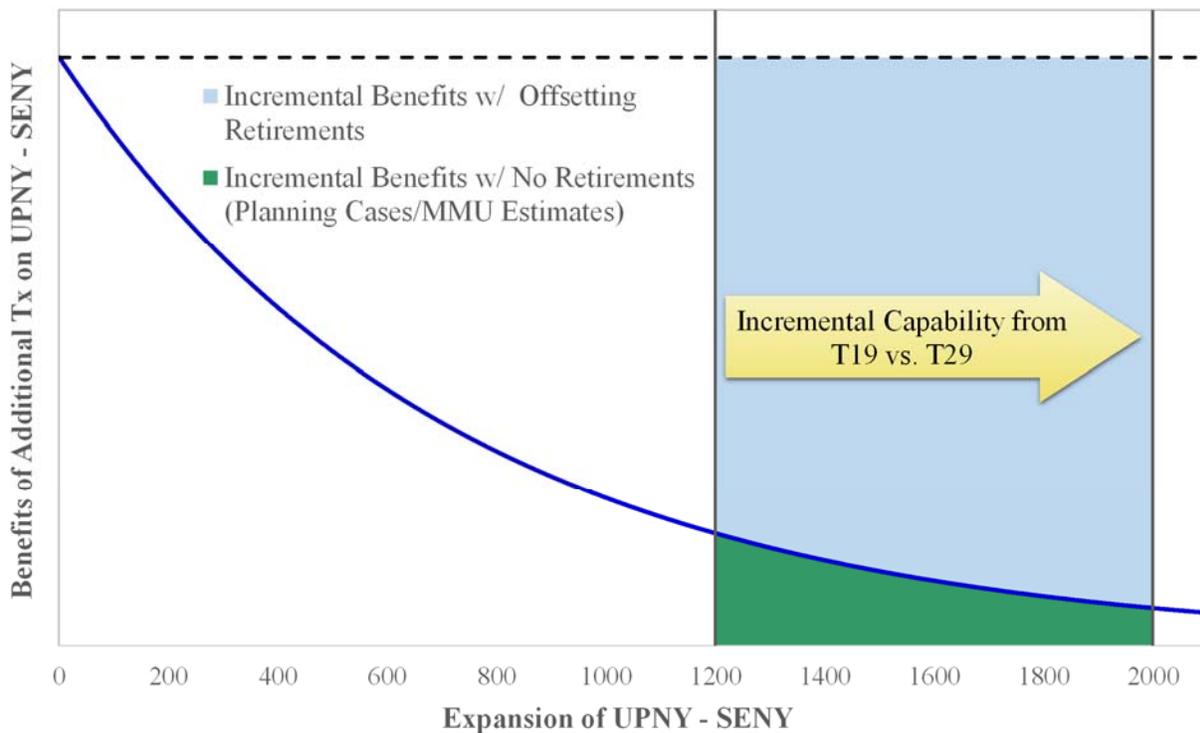
<sup>3</sup> Appendix A provides additional details about the MMU’s method of estimating capacity benefits.

MMU estimates were based on planning cases from NYISO’s AC Transmission Study that assume capacity additions and retirements that cause the UPNY-ConEd interface to be the primary transmission bottleneck, and the UPNY-SENY interface to not be a substantial bottleneck. Alternatively, the assumed supply changes under the NYISO’s Optimizer leads the primary transmission bottleneck to be the UPNY-SENY interface, even after the AC Tx Projects are built. Since the two projects vary mainly in their effects on the UPNY-SENY interface, *the difference in supply assumptions is the primary factor explaining the wide variation in estimates.*

**C. Assumed Changes in Supply and Transmission Bottlenecks**

As a transmission constraint is relieved, the incremental benefits of further relief falls. This reduction is depicted illustratively in the Figure 1 for the Recommended Projects and the Alternative Project. The Alternative Projects provide much more transfer capability than the Recommended Projects on the UPNY-SENY interface: 2,000 MW vs. 1,200 MW. The solid blue line in this figure represents the diminishing marginal benefit of increasing the interface capability. The shaded areas in this figure show the aggregate benefits of the additional 800 MW of transmission capability provided by the Alternative Projects. These areas vary based on the assumed supply changes (additions and retirements) in different scenarios, which is discussed later in this section.

**Figure 1: Incremental Benefits of Additional Capacity on the UPNY-SENY Interface**



As discussed in the prior section, the most important factor that determines the incremental benefits of expanding UPNY-SENY from 1200 MW to 2000 MW is the assumed changes in

supply over time. At a high level, the changes that *increase* the incremental capacity benefits include:

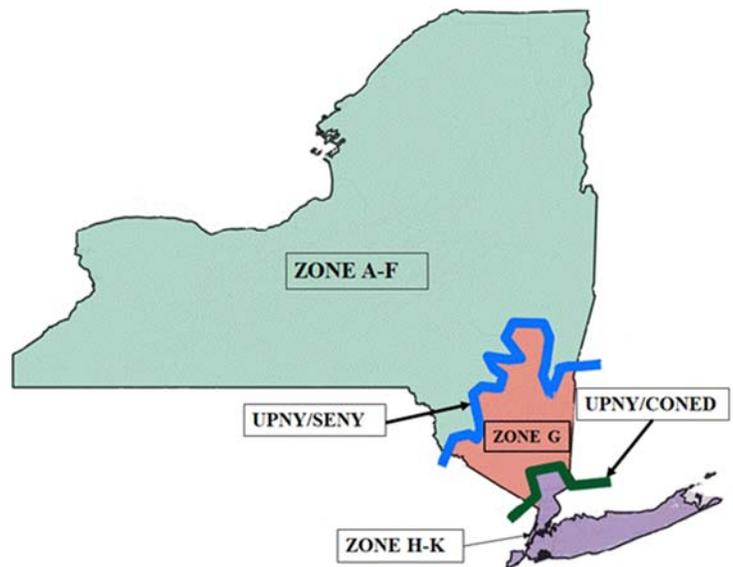
- ✓ Low-cost units entering North of UPNY-SENY; and
- ✓ Retirements South of UPNY-SENY (particularly in Zone G).

Alternatively, the changes that *decrease* the incremental capacity benefits include:

- ✓ New entry South of UPNY-SENY; and
- ✓ Retirements North of UPNY-SENY.

In the MMU results based on the AC Transmission planning cases, no retirements are assumed in Zone G, which is just south of UPNY-SENY. The current surplus capacity in SE NY tends to limit the benefits of continuing to expand this interface. The total benefits of the incremental 800 MW expansion of UPNY-SENY is illustrated in the green area. However, if one assumes large quantities of retirements in Zone G and SE New York occur such that UPNY-SENY remains just as congested after the AC Transmission Projects are built as before, the incremental benefits of the additional 800 MW of transfer capability are much greater. These additional benefits are illustrated in the blue area in Figure 1. One of the key elements of this evaluation, therefore, is to project a reasonable quantity of retirements in Zone G.

Before discussion the alternative assumptions in different cases, it is also important to note the location and importance of UPNY-SENY versus the UPNY-ConEd interface. This map shows the location of these interfaces. In reality, when the UPNY-ConEd constraint binds and becomes a bottleneck in the dispatch, additional flows over the UPNY-SENY interface will be restricted. Neither project expands UPNY-ConEd substantially. This limits the capacity benefits of expanding UPNY-SENY. The Alternative Projects provide slightly more additional transfer capability on UPNY-ConEd than the Recommended Projects: 375 MW vs. 350 MW. The benefits of this additional 25 MW are included in the MMU benefit estimates.

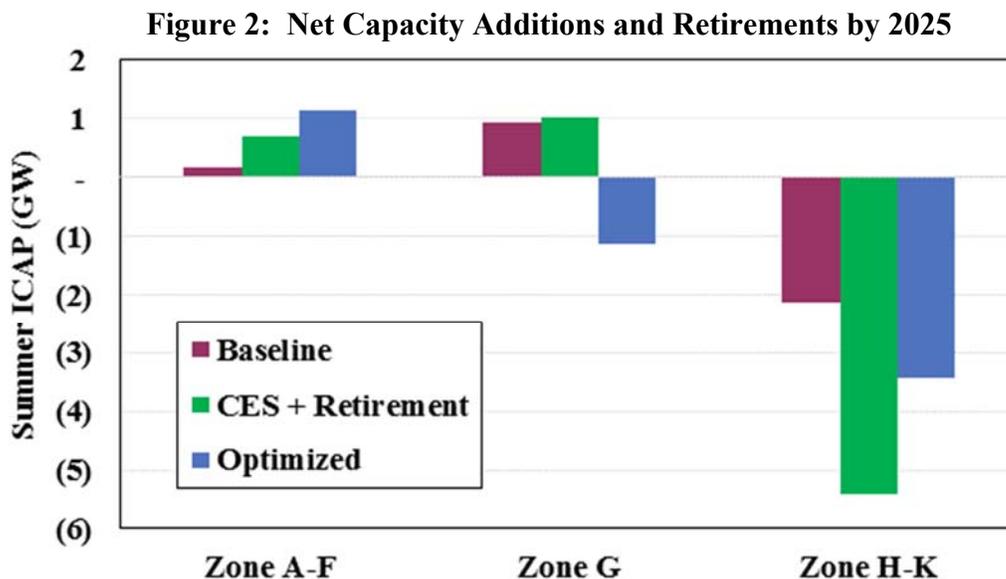


Additionally, the lack of substantial additional transfer capability over the UPNY-ConEd interface explains why the incremental capacity benefits are sensitive to where resources are assumed to retire in SE New York. Retirements in Zones H-K will tend to make the UPNY-ConEd interface more binding and limit the incremental benefits of expanding UPNY-SENY.

Retirements in Zone G, however, will not contribute to congestion on UPNY-ConEd and will maximize the benefits of expanding UPNY-SENY.

Hence, it is important to assess whether the assumptions about future additions and retirements are reasonable in each scenario. Figure 2 summarizes capacity additions and retirements that were assumed in each region of the state in each scenario (relative to the existing generation fleet in October 2018). The Baseline scenario assumes 1 GW of capacity additions in Zone G (Cricket Valley) and 2 GW of retirements in Zones H-K (Indian Point in Zone H). These baseline changes reduce flow across UPNY-SENY and increase flow across UPNY-ConEd, which limits the capacity benefits of the additional 800 MW of expanded capability on UPNY-SENY offered by the Alternative Projects.

The CES + Retirement Scenario includes the baseline changes, but also assumes sizable net capacity additions in Zones A to F (a large quantity of renewables partially offset by retirement of coal resources). It also assumes a large quantity of retirements in Zones J-K (peaking resources), which increases flow mainly across UPNY-ConEd. Although the upstate net additions increase the value of the UPNY-SENY interface, the retirements in Zones J-K cause a bottleneck on UPNY-ConEd that limit the increase in capacity benefits.



In contrast, the Optimizer results assume even larger capacity additions in Zones A to F and more than 2 GW of incremental retirements in Zone G from the Baseline Scenario. This case also includes more than 1 GW of additional retirements in Zones J and K beyond the Baseline Scenario. These assumed supply changes substantially increase the projected transmission flows and congestion on the UPNY-SENY interface. This predictably leads to much higher capacity benefits of the additional 800 MW of transfer capability provided by the Alternative Projects over the UPNY-SENY interface.

A key takeaway from this analysis is that future retirements and additions will dictate where new transmission would be most valuable. In particular, large amounts of retirement in Zone G

would make the AC Tx Projects much more valuable, but if retirements are more concentrated in downstate areas (i.e., Zones H-K), the capacity benefits from the new AC Tx Projects will be much lower.

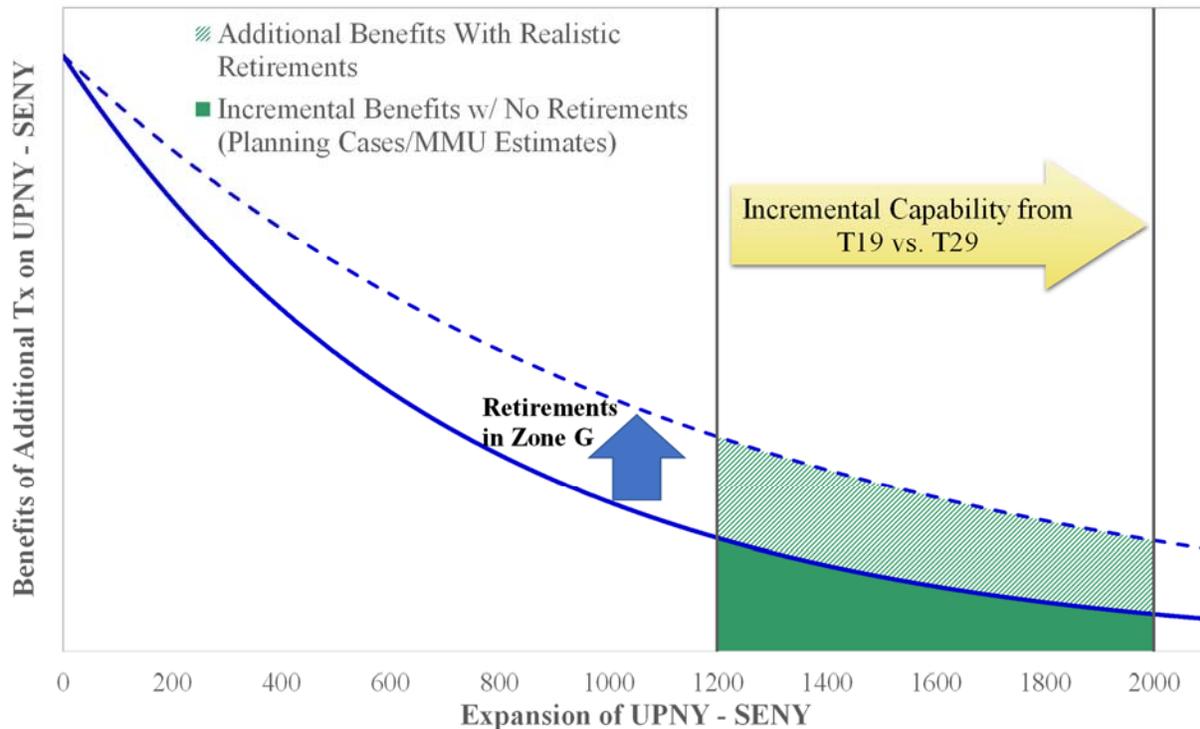
Given the current large capacity surplus, it is reasonable to expect significant retirements in the coming years, however, the location of those retirements will depend on state environmental policies and the economics of existing generation. We have considered these factors and find that none of the three scenarios that currently exist are realistic:

- The Baseline scenario's assumption of no retirements in Zone G after the entry of Cricket Valley is unrealistic because this would result in capacity prices that are substantially below the going forward costs of some of the existing generation in Zone G.
- The CES + Retirement scenario assumes no retirements in Zone G after the entry of Cricket Valley. This assumption is more reasonable in this scenario because the large amounts of assumed retirements in Zones J and K would raise statewide capacity prices and cause the resources in Zone G to be much more economic to continue operating. However, we believe these assumed policy-induced retirements in Zones J and K are unrealistic.
- The Optimizer results in 2 GW of generation retirements in Zone G. While the Optimizer is an improvement for determining the short-term locational demands for capacity (i.e., the LCRs), it is not designed to predict where retirements will occur over the longer run because it does not consider the going forward costs of the existing generation. For example, the Optimizer may indicate that the NYISO's LCRs in Zone G should be zero, but that does not mean that the resources in Zone G will retire because they may be economic to meet the statewide requirements if their going-forward costs are low.

We evaluate the economics of capacity in New York after: a) Indian Point retires, b) AC Transmission is built, and c) state policies lead to retirements outside of Zone G (including 1 GW of coal generation in western New York and some of the older peaking units downstate). We find that these factors will support statewide capacity prices and make older Zone G generation more profitable. Based on these capacity price projections, we do not anticipate more than 1 GW of retirements in Zone G after the entry of the new Cricket Valley plant.

Without additional modeling, we cannot quantify the capacity market benefits that would result from the AC Transmission Projects under a "realistic" retirement scenario (e.g., assuming 1 GW of retirements in Zone G). However, we expect the answer would be substantially higher than the estimate for the Baseline scenario and substantially lower than the estimate produced by the NYISO's Optimizer. The effects of such a scenario are illustrated in Figure 3.

**Figure 3: Incremental Capacity Benefits under a Realistic Retirement Scenario**



The actual incremental capacity benefits will depend on a number of uncertain quantities, including the ultimate outcome of the State policies in Western New York, New York City, and Long Island. Additionally, the State has announced plans to build sizable amounts of off-shore wind resources that would interconnect in SE New York. This would place downward pressure on the incremental capacity benefits.

Taking all of these factors into account, we believe the most likely range of incremental capacity benefits offered by the Alternative Projects is \$30 to \$100 million.

#### D. Conclusion

Capacity benefits are relatively uncertain because they depend on decisions over a long time horizon by participants and the State. Because of the uncertainty, it would be reasonable to give these benefits less weight in the selection than more certain costs and benefits.

Estimated capacity benefits employing the most likely or reasonable assumptions regarding retirements and additions have not been produced and would require significant additional work by NYISO planning staff. Nonetheless, we believe that the incremental capacity benefits of the Alternative Projects compared to the Recommended Projects will likely range between \$30 to \$100 million. If the State builds substantial offshore wind interconnecting to SE New York, the capacity benefits are likely to be on the lower side of this range.

In our initial report on the Recommended Projects, we evaluated a number of other significant factors that together determine whether the project is economic. These factors included:

- production cost savings;
- environmental benefits; and
- avoided maintenance and refurbishment costs for existing transmission that would be replaced by the new projects.

We have not evaluated these factors for the Alternative Projects. This evaluation could cause our final conclusions to vary for the Alternative Projects, which should be considered before a final selection is made.

## Appendix A: Summary of Benefit-Cost Assessment for the Recommended Transmission Projects

In the course of its evaluation, the NYISO analyzed the effects of proposed transmission projects on the system using an array of production cost, resource adequacy, and other models. We used these modeling results to quantify the benefits of proposed projects. Our evaluation is discussed further in the MMU Report on the AC Tx Projects.<sup>1</sup>

### 1. Categories of Benefits included in our Benefit-Cost Ratio

*Environmental Benefits* – Includes the value of CO<sub>2</sub> emissions abatement across New York, New England, Ontario, and PJM, assuming the New York state continues to participate in the Regional Greenhouse Gas Initiative (“RGGI”).

*Production Cost Savings* – Includes reductions in fuel costs, variable O&M costs, and other production costs (excluding RGGI allowance costs) across the same region.

*Capacity Benefits*, which include both:

- *Generation Investment Cost Savings* – Includes the reduced cost of investment in generation needed to satisfy the minimum resource adequacy planning standard.
- *Reliability Benefits* – The capacity value of more reliable service (than the minimum resource adequacy standard of 1 day in 10 years) is best measured by how the projects affect the loss of load expectation (“LOLE”). We quantify this based on the compensation that a generator would receive in the capacity market for providing comparable LOLE benefits.<sup>4</sup>

*Avoided Costs from Replacement of Aging Equipment* – When new transmission equipment replaces existing equipment, there are two types of potential cost savings. First, there is an O&M cost reduction that helps offset the O&M costs of the new equipment. Second, if the existing equipment is at the end of its useful life and needs to be replaced or otherwise refurbished, it would require capital expenditures that are made unnecessary by the new equipment.

These categories above are included in a single benefit-cost ratio, which provides the best overall measure of the value of a project relative to costs.

Our review focuses on two scenarios that were evaluated by the NYISO:

- Baseline Case, which used assumptions from the 2017 CARIS study with several updates, reflects conditions that might be expected without significant public policy intervention by New York State; and

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<sup>4</sup> Additional reliability benefits are embedded in the economic benefits because transmission reduces the cost of satisfying the system’s real-time reliability needs.

- CES+Retirement Scenario, which assumed that New York achieves the Clean Energy Standard (“CES”) by constructing 16.2 GW of new renewable generating capacity and retiring all coal-fired generation and 3.5 GW of older peaking generation in downstate areas. This reflects conditions if the state moves forward with several initiatives to retire existing generation and achieves the CES with land-based wind and solar generation primarily in upstate areas.

## 2. Summary of the Benefit-Cost Assessment for the Recommended Projects

Figure 1 shows that based on the combined Environmental, Economic, and Reliability benefits, the overall Benefit-Cost Ratio is 0.83 in the Baseline Case and 1.77 in the CES+Retirement Scenario over a 45-year period. These estimates are based on a total cost of \$1.77 billion, including:

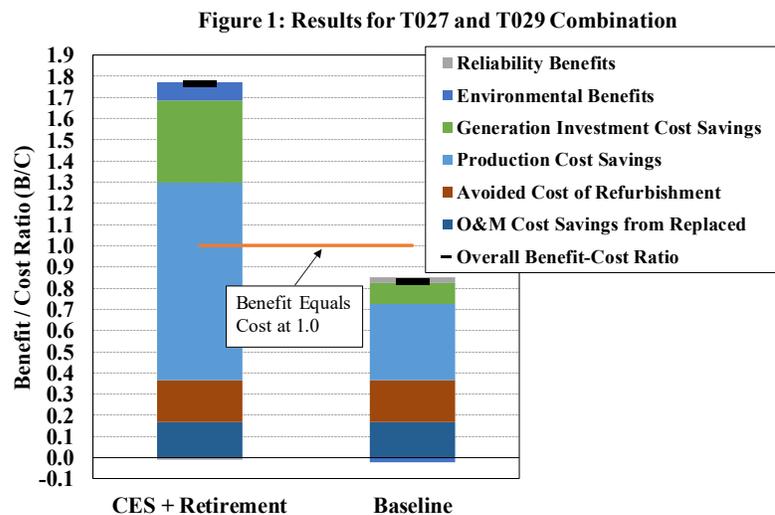
- Overnight costs,
- Costs of associated local upgrades,
- Interest during construction and financing costs, and
- O&M costs over the 45-year period.

Thus, the recommended projects are unlikely to be cost-effective if significant changes in the resource mix do not occur because of key public policy initiatives.

There is considerable uncertainty regarding the benefits from the recommended transmission projects because the benefits would depend on where renewable resources are placed to satisfy the CES. The NYISO

assumed that 14 GW of land-based wind and utility-scale solar additions would be made outside Southeast New York (“SENY”) and that just 226 MW of offshore wind would be placed in downstate areas. However, after the NYISO’s study was underway, NYSERDA announced plans to solicit 2.4 GW of offshore wind in downstate areas by 2030, including 800 MW in 2018 and 2019.

In general, increased offshore wind in downstate areas would reduce the need for renewables outside SENY to satisfy the CES, and ultimately reduce congestion into the downstate areas. Hence, the recent shift in the planned placement of renewable generation (from upstream to downstream of the projects) would make the AC Transmission Projects less beneficial.



## Appendix B: Comparison of Capacity Benefits for Recommended and Alternative Projects

### 1. Capacity Benefit Metric Methodology

*Generation Investment Cost Savings* – An important economic benefit from the proposed transmission projects is that they would reduce the need to build and/or maintain installed capacity to satisfy minimum planning criteria for resource adequacy and inter-zonal transmission security, particularly capacity in downstate areas where investment costs are generally higher. We estimate the investment cost savings from the recommended projects based on how they would affect the Compensatory MWs necessary to satisfy the resource adequacy standard (i.e., 0.1 LOLE). The following example illustrates how we calculated this type of economic benefit:

- Suppose that in the base case, 400 MW of Compensatory MWs would be needed in Zone J to maintain LOLE below 0.1 in particular year.
- In the project case, upstate capacity would be more deliverable to downstate loads, so assume that the LOLE could be maintained below 0.1 with Compensatory MWs of 300 MW in Zone C and 50 MW in Zone J.
- With these assumptions, and assuming net CONE values of \$177 and \$100/kW-year in Zones J and C, respectively, the net investment cost savings is calculated as follows:
  - ✓ Investment Cost Savings in Zone J in one year = \$62 million =  $(400 \text{ MW} - 50 \text{ MW}) \times \text{Net CONE of } \$177/\text{kW-year}$
  - ✓ Investment Cost Increase in Zone C in one year = \$30 million =  $300 \text{ MW} \times \text{Net CONE of } \$100/\text{kW-year}$
  - ✓ Net Investment Cost Savings in one year = \$32 million = Investment Cost Savings in Zone J minus Investment Cost Increase in Zone C

*Reliability Benefits* – This metric captures the market value of more reliable service (i.e., more than the minimum resource adequacy standard requires). We estimate this based on how additional reliability is valued in the installed capacity market. These benefits are best measured by how the projects affect the loss of load expectation (“LOLE”). We quantify this based on the compensation that a generator would receive in the capacity market for providing comparable LOLE benefits.

We estimate the reliability benefits from the recommended projects to the extent that they improve the NYCA LOLE in each year of the study. The value of improved LOLE is consistent with the compensation that surplus generation resources in the capacity market receive that also improve the LOLE. Based on our evaluation of the capacity demand curves and locational capacity requirements for the 2018/19 Capability Year, we estimate that generating resources are paid \$2.9 million per 0.001 change in the LOLE per year.

The following example illustrates how we calculated these benefits for the transmission projects.

- Assuming that:
  - ✓ In the base case for a particular year, the LOLE is 0.08 days per year;
  - ✓ In the project case for the same year, the LOLE is 0.06 days per year; and
  - ✓ The implied value of a 0.001 change in LOLE is \$2.9 million.
- The annual reliability benefit = \$58 million:
  - ✓  $(0.08 - 0.06 \text{ days per year change in the LOLE}) \times \$2.9 \text{ million per } 0.001 \text{ change in LOLE annually.}$

The net present value of the Investment Cost Savings and Reliability Benefits are calculated over an assumed 45-year project life cycle, using the benefits from the last year of the evaluation period to estimate savings in years 21 to 45.

## 2. Results of Comparison between the Recommended Projects and Alternative Projects

For the Baseline Case, the estimated capacity market benefits were:

- \$259 million for the Recommended Projects (T027/29) or 15 percent of the lifecycle cost of the projects.
- \$290 million for the Alternative Projects (T027/19).<sup>5</sup>

For the CES+Retirement Case, the estimated capacity market benefits were:

- \$716 million for the Recommended Projects (T027/29) or 40 percent of the lifecycle cost of the projects.
- \$819 million for the Alternative Projects (T027/19).

Thus, the Alternative Projects would provide an estimated \$31 to \$103 million of additional capacity market benefits over a 45-year project life. The actual difference will depend on where additions and retirements occur in the future and how this affects the location of transmission bottlenecks. The low end of this range is based on the Baseline Case, which assumes there is no state policy to contract for new renewable generating capacity. The high end of this range is based on the CES+Retirement Case, which would satisfy the CES (“Clean Energy Standard”) primarily with renewables in upstate New York. However, the NYPSC and NYSEDA have signaled their intention to rely more on offshore wind in downstate areas, which would reduce the value of the AC Transmission Projects.

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<sup>5</sup> We did not estimate the lifecycle costs of the Alternative Projects.

The Alternative Projects provide larger capacity market benefits primarily because they would increase transfer capability from upstate New York into the ConEd service territory by 375 MW compared to 350 MW for the Recommended Projects. The Alternative Projects would also provide more additional transfer capability into Southeast New York than the Recommended Projects.

Our capacity benefit estimates rely on modeling results that were produced by the NYISO in the course of its evaluation. Consequently, our estimates of investment cost savings were based on scenarios where the future generation investments were not made in the most cost-effective areas (because these scenarios were designed for a different purpose). It is likely that the investment cost savings were over-estimated for the CES+Retirement Case by up to 15 percent because the NYISO's future generation investment scenarios relied on investment in New York City when more cost-effective opportunities were available in Long Island. On the other hand, it is likely that the investment cost savings were under-estimated for the Baseline Case by up to 25 percent because of where the NYISO's future generation investment scenarios assumed new resources would enter.

## Appendix H – ABB Subsynchronous Resonance Mitigation Cost Estimation Report



# The New York Independent System Operator Subsynchronous Resonance Mitigation Cost Estimation FINAL

Report No. E23496-01

23 October 2018  
Revised: 31 October 2018



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## SUMMARY

The NYES-Segment B – Public Policy AC Transmission Project (Queue #543) with the New York Independent System Operator (NYISO) area includes a series capacitor to provide 50% compensation on the new Pleasant Valley–Knickerbocker 345 kV transmission line. The series capacitor along with its bypass and protective functions will be located at the new Knickerbocker 345 kV switching station.

An earlier study to evaluate the potential for subsynchronous resonance (SSR) issues between the series capacitor and local generation was performed by another consultant on behalf of National Grid. The study indicated concerns related to the Empire, Athens and Cricket Valley generating facilities. NYISO retained ABB Power Consulting in Raleigh, NC to develop conceptual mitigation measures for the SSR issues with these generating facilities and to provide high-level cost estimates for the implementation of the measures. This report documents a review of those mitigation measures and provides high-level cost estimates for each of those that ABB supplies.

ABB has some concerns relative to the earlier study that are also documented in this report. The earlier study considered three types of subsynchronous phenomena – induction generator effect (IGE), torsional interaction (TI), and torque amplification (TA). The methods used for IGE and TA screening appear to be appropriate but some details related to the methods are unclear. On the other hand, the approach to TI is considered by ABB to be inadequate for determining whether or not TI is an actual concern for the subject plants. Preliminary, cursory evaluations by ABB indicates that TI may be a concern for the Empire plant under as little as one outage (i.e. N-1 conditions). On the other hand, studies may indicate that TI is not a concern due to the characteristics of the generators involved. In other words, based on the current information available, the risk for SSR is inconclusive and additional information about the generators is required to establish the risk for SSR. (For additional information please see Section 2.2.2 herein). Therefore, ABB recommends that a more appropriate screening study be performed before any mitigation option is selected, to ensure that the risk for SSR has been correctly identified.

Relative to the mitigation options, the following summaries are provided along with a recap in Table S-1. Equipment costs are the estimated installed costs. If SSR mitigation is required only at the Empire plant, ABB estimates that the costs will range between \$565,000 and \$1,300,000. If SSR mitigation is required at Empire, Athens and Cricket Valley the estimated costs range between \$1,860,000 and \$4,875,000.

From a technical perspective, ABB recommends that Option 5 be first considered followed by Option 2, then Option 4. Backup protection from a scheme similar to Option 1 is recommended for each of these recommended options.

- **Option 1: SSR Protective Relays at Generators to Trip Generators** – This option provides redundant relaying at the generator terminals to detect SSR conditions and trip the generators if necessary.

***Budgetary Costs:***

Empire facilities only:

- Study to define generator characteristics and relay settings: \$70k-\$100k
- Redundant relays and panels for 3 generators: \$535k - \$800k

Empire/Athens/Cricket Valley facilities:

- Study to define generator characteristics and relay settings: \$125k-\$175k
- Redundant relays and panels for 15 generators: \$2.3M - \$3.5M

*Note: ABB ranks Option 1 as the 4<sup>th</sup> best in terms of technical merit. ABB’s standard practice is to recommend this type of protection as back-up protection in case other mitigation measures fail. When used as back-up protection, as noted in other options below, a single relay (as opposed to redundant relays) may suffice.*

- **Option 2: SSR Detection at Generators to Bypass Series Capacitor** – This option provides redundant relaying at the affected plants. It is assumed that relays monitoring the high-voltage side of the GSUs is adequate for this option. If SSR is detected at the plant, a transfer-trip signal will be sent to the Series Capacitor to bypass.

***Budgetary Costs:***

Empire facilities only:

- Study to define generator characteristics and relay settings: \$70k-\$100k
- Redundant relays and panels for 3 generators: \$480k - \$720k
- Back-up generator relays and panels for 3 generators: \$325k - \$480k

Empire/Athens/Cricket Valley facilities:

- Study to define generator characteristics and relay settings: \$125k-\$175k
- Redundant relays and panels for 3 generators: \$1.5M - \$2.3M
- Back-up generator relays and panels for 15 generators: \$1.6M - \$2.4M

*Note: ABB ranks Option 2 as 2<sup>nd</sup> best in technical merit. If selected, it should be used with back-up protection at the affected generators. Note that the actual need for mitigation needs to be determined based on adequate studies of the SSR risk. If this options is selected, it should be used with non-redundant back-up protection at the affected generators.*

- **Option 3: Resonant Blocking Filters** – This option places specially designed filters at the neutral end of the GSU high-voltage winding to prevent the flow of currents at specific frequencies into the system. This option has been used as some facilities in the past but has not become a “standard” solution.

**Budgetary Cost:** Not Available – ABB does not provide this solution

*Note: ABB ranks Option 2 last in technical merit. ABB does not recommend this mitigation method.*

- **Option 4: Remedial Action Scheme No. 1** – This option provides a bypass signal to the series capacitor any time a proper combination of line outages will result in SSR. As originally indicated by NYISO, the intent was to bypass the SC when all lines identified in the earlier study are out, but the issue is more complicated than implied in that study and significant communications and logic may be involved once the actual SSR risk conditions are correctly identified. A similar approach used elsewhere in the NYISO system suffered from communication issues causing nuisance bypassing of the series capacitors resulting in a blended solution using Option 4 and Option 5.

***Budgetary Costs:***

Empire facilities only:

- Study to define generator characteristics and relay settings: \$30k-\$50k
- Redundant relays and panels for 3 buses: \$515k - \$770k
- Back-up generator relays and panels for 3 generators: \$325k - \$480k

Empire/Athens/Cricket Valley facilities:

- Study to define generator characteristics and relay settings: \$50k-\$75k
- Redundant relays and panels for 6 buses: \$620k - \$930k
- Back-up generator relays and panels for 15 generators: \$1.6M - \$2.4M

- **Option 4a: Remedial Action Scheme No. 2** – This option provides a bypass signal to the series capacitor when only local critical transmission paths at the Knickerbocker substation that could lead to SSR become out of service. This option faces the same challenges indicated above for Option 4 – namely, that the outages that can lead to actual SSR conditions of concern need to be determined by study and it may be that some of those conditions may not involve an outage at the Knickerbocker substation.

***Budgetary Costs:***

Empire facilities only:

- Study to define generator characteristics and relay settings: \$30k-\$50k
- Redundant relays and panels for 3 lines: \$210k - \$315k
- Back-up generator relays and panels for 3 generators: \$325k - \$480k

Empire/Athens/Cricket Valley facilities:

- Study to define generator characteristics and relay settings: \$50k-\$75k
- Redundant relays and panels for 8 lines: \$210k - \$315k
- Back-up generator relays and panels for 15 generators: \$1.6M - \$2.4M

*Note: ABB ranks Option 4/4a as 3<sup>rd</sup> best in technical merit. Note that the actual need for mitigation needs to be determined based on adequate studies of the SSR risk. If this options is selected, it should be used with non-redundant back-up protection at the affected generators.*

- **Option 5: SSR Detection at Series Capacitor to Bypass Series Capacitor** – This option detects SSR at the series capacitor and bypasses the series capacitor when specified frequencies are detected at sufficient levels to be of concern.

***Budgetary Costs:***

Empire facilities only:

- Study to define generator characteristics and relay settings: \$100k-\$150k
- Redundant relays and panels for 1 bus: \$400k - \$600k
- Back-up generator relays and panels for 3 generators: \$325k - \$480k

Empire/Athens/Cricket Valley facilities:

- Study to define generator characteristics and relay settings: \$125k-\$175k
- Redundant relays and panels for 1 bus: \$400k - \$600k
- Back-up generator relays and panels for 15 generators: \$1.6M - \$2.4M

*Note: ABB ranks Option 5 as 1<sup>st</sup> best in technical merit. The actual need for mitigation should be determined based on adequate studies of the SSR risk. If this options is selected, it should be used with non-redundant back-up protection at the affected generators.*

The options above have been evaluated with the assumption that no changes can be made to the Queue #543 series capacitor itself. Additional mitigation options that might be considered for any future installations are also provided in the report for informational purposes only.

**Table S-1: Mitigation options recap**

Option	Description	Plants	Budgetary Costs (Installed)	Recommended Order of Technical Preference
1	Redundant SSR protection at generators	Empire	Studies: \$70k - \$100k Equipment: \$535k - \$800k Total: \$605k - \$900k	4
		Empire/Athens/ Cricket Valley	Studies: \$125k - \$175k Equipment: \$2.3M - \$3.5M Total: \$2.425M - \$3.675M	
2	Redundant SSR detection at generator plant with transfer bypass of series capacitor and backup protection at generators	Empire	Studies: \$70k - \$100k Equipment: \$480k - \$720k Backup: \$325k - \$480k Total: \$875k - \$1.300M	2
		Empire/Athens/ Cricket Valley	Studies: \$125k - \$175k Equipment: \$1.5M - \$2.3M Backup: \$1.6M - \$2.4M Total: \$3.225M - \$4.875M	
3	Resonant blocking filters on GSUs with backup protection at generators		ABB does not supply this solution and cannot comment on the potential cost.	Not Recommended
4	Remedial action scheme to identify contingencies leading to SSR risk with transfer bypass of series capacitor and backup protection at generators	Empire	Studies: \$30k - \$50k Equipment: \$515k - \$770k Backup: \$325k - \$480k Total: \$870k - \$1.300M	3
		Empire/Athens/ Cricket Valley	Studies: \$50k - \$75k Equipment: \$620k - \$930k Backup: \$1.6M - \$2.4M Total: \$2.270M - \$3.405M	
4a	Remedial action scheme to detect loss of critical lines at series capacitor bus and bypass series capacitor with backup protection at generators	Empire	Studies: \$30k - \$50k Equipment: \$210k - \$315k Backup: \$325k - \$480k Total: \$565k - \$845k	
		Empire/Athens/ Cricket Valley	Studies: \$50k - \$75k Equipment: \$210k - \$315k Backup: \$1.6M - \$2.4M Total: \$1.860M - \$2.790M	
5	Redundant SSR detection at series capacitor to bypass series capacitor with backup protection at generators	Empire	Studies: \$100k - \$150k Equipment: \$400k - \$600k Backup: \$325k - \$480k Total: \$825k - \$1.230M	1
		Empire/Athens/ Cricket Valley	Studies: \$125k - \$175k Equipment: \$400k - \$600k Backup: \$1.6M - \$2.4M Total: \$2.125M - \$3.175M	

\* - represents high-end estimate only

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# 1 Introduction

The NYES-Segment B – Public Policy AC Transmission Project (Queue #543) with the New York Independent System Operator (NYISO) area includes a series capacitor to provide 50% compensation on the new Pleasant Valley–Knickerbocker 345 kV transmission line. The series capacitor along with its bypass and protective functions will be located at the new Knickerbocker 345 kV switching station.

A previous study ([1]) performed on behalf of National Grid indicated the potential for subsynchronous resonance (SSR) issues between the series capacitor and local generation at the Empire, Athens and Cricket Valley generating facilities. NYISO retained ABB Power Consulting in Raleigh, NC to develop conceptual mitigation measures for the SSR issues with these generating facilities and to provide high-level cost estimates for the implementation of the measures.

This report documents the conceptual approaches specifically identified by NYISO along with a few other measures for consideration in future projects.

Section 2 of this report provides a few observations by ABB on the methods and results of the previous study. Section 3 describes the generating facilities being considered and the outages required to place these facilities in a radial connection to the Queue #543 series capacitor. Section 4 discusses the requested mitigation concepts, while Section 5 discusses the additional measure that could be considered. Estimated costs are only provided on the concepts of Section 4 for which ABB provides equipment.

## 2 Comments on Subsynchronous Phenomena

Since series compensation in transmission lines is always less than 100%, and typically less than 70%, the resonant frequency of the series connection of the transmission line and the series capacitor will be below the nominal operating frequency of the system – in other words, it will be subsynchronous. There are three primary phenomena that can occur between generation facilities and the series compensated system due to this subsynchronous resonance:

- 1) Induction Generator Effect (IGE) and the strongly related Subsynchronous Control Interaction (SSCI) with Type 3 wind turbine generators;
- 2) Torsional Interaction (TI); and,
- 3) Torque Amplification (TA).

The SSR screening report ([1]) provided as input for this cost estimation evaluation discusses these three phenomena, but appears to be very limited in the evaluation of the phenomena and the potential risks for the Empire, Athens and Cricket Valley generating facilities that are of concern for the effort of this report. As such, a few observations are made relative to the phenomena based on ABB's experience with subsynchronous phenomena.

### *2.1 Induction Generator Effect*

IGE is a purely electrical phenomenon that can occur when a resonant condition ( $X=0$ ) exists in the connected system impedance as viewed from the rotor of a machine looking into the system. If the resistance as viewed from the rotor is negative at the resonant frequency, an undamped situation arises and electrical oscillations at the resonant frequency will grow exponentially. While the phenomenon tends to occur more readily with asynchronous machines, the fact that it occurs at subsynchronous frequencies where synchronous machines behave as asynchronous relative to any excitation at those frequencies, IGE remains a possibility for synchronous machines as well.

Nevertheless, IGE has been something of a “red herring” when it comes to synchronous generators with few if any events actually being confirmed. The negative resistance occurs because of machine action and the slip across the air-gap making the rotor resistance appear negative when the operating speed is above that which would be associated with excitation at the resonant frequency. For the total “machine+system” resistance to appear negative, the machines typically require a relative large rotor winding resistance. Synchronous generator rotor resistances are normally too small to overcome the system losses and the addition of amortisseur windings are typically sufficient to address IGE concerns if they exist.

IGE can happen more readily with Type 1 and Type 2 wind turbine generators where high rotor resistances are used to increase the operating speed range of the asynchronous machines. A strongly related phenomenon occurs with Type 3 wind turbine generators where the controls of the parallel converter create a virtual rotor resistance that is high at subsynchronous frequencies. This phenomenon has been dubbed by the industry as

Subsynchronous Control Interaction (SSCI) and many wind turbine manufacturers have developed controls for their Type 3 machines that effectively address SSCI when needed.

The screening study of [1] addresses IGE for the generating plants evaluated, and the approach appears to be correct, but details of the generator representations are not provided, so the conclusions cannot be fully commented upon. Also, the study does not address SSCI. This is perhaps because no wind park projects in the NYISO Queue are close to the Queue #543 series capacitor. However, ABB strongly recommends that NYISO keep in mind the possibility of SSCI if future projects desire to interconnect close to any series compensation within their system. It is noted, as an aside, that the only events to date in which SSCI is confirmed, have occurred when the wind plant become completely radially connected to the series compensation so that there are no other alternate transmission paths or other generation between the wind plant and the series compensated lines.

## 2.2 Torsional Interaction

### 2.2.1 Concern Regarding Previous Study Results

It is ABB's opinion that the process described in [1] is inadequate for the evaluation of TI. Torsional interaction is an electro-mechanical phenomenon that requires the consideration of damping provided by the electrical system (i.e. electrical damping) on the machine shaft torsional modes as well as the inherent mechanical damping present at those modes. In order to evaluate TI, at a minimum, the electrical damping across the subsynchronous frequency range must be calculated taking into consideration of the machine's electrical characteristics and all reasonable system configurations. Then, using that electrical damping, the following general assessment can be made:

- 1) If the electrical damping is positive at all frequencies at which a machine torsional mode may exist, there is no TI concern;
- 2) If the electrical damping becomes negative under any reasonable system configuration and at any frequency at which a machine torsional mode may exist, there may be a TI concern. Without details of the machine's mechanical shaft parameters, the result is inconclusive. Knowledge about the machine's natural mechanical frequencies of rotational oscillations is required to fully assess the TI risk. Note that a reactance of zero ( $X=0$ ) in the frequency scan is neither a sufficient nor a necessary condition for TI to be of concern. This means that TI may occur at N-1 conditions even if N-3 or higher is necessary to provide a resonance ( $X=0$ ) at some frequency. In addition, the frequency range of the negative electrical damping typically shifts with different contingencies and may create or remove TI concerns as it shifts.

Because [1] appears to consider TI a concern only if a zero crossing of the reactance occurs, and does so for many generators in the proximity of the Queue #543 series capacitor, ABB strongly recommends that a study be performed that properly considers the electrical damping – and, if possible, the mechanical torsional modes – of the synchronous machines.

## 2.2.2 Additional Information on TI

The discussion in this section is intended to elaborate on issues related to TI and to provide supporting information to the recommendation for the performance of an appropriate study.

Torsional interaction occurs when the effects of an electrical resonance properly align in frequency with a mechanical torsional mode of a machine. The torsional modes of interest are the subsynchronous natural modes of mechanical oscillations. These oscillatory modes are a function of the rotational inertias of the masses along a machine shaft and of the rotational stiffness of the shaft (its resistance to twisting motion as opposed to its resistance to lateral deflection).

In order to adequately evaluate TI, even in a screening study, it is necessary to identify both the mechanical resonant frequencies and the electrical damping expected to be presented by the electrical network at the generator. Ideally, this electrical damping can be directly compared to the mechanical torsional modes and their mechanical damping levels to ascertain whether or not any negative electrical damping is sufficient to overcome the inherently positive mechanical damping at the natural frequencies of the shaft. In the early stages of any generation project, it is usually difficult to obtain sufficient information about the generators to determine the mechanical modes and their damping. In such cases, some preliminary conclusions can be drawn based purely on the electrical damping and a very conservative assumption of zero mechanical damping. Doing so allows an estimation of the number of outages and the specific outages that are likely to raise a risk of SSR for a given generating facility.

An example is provided in Figure 2-1 for a sample generator that becomes radial to a series capacitor under N-3 conditions. The corresponding impedance scans are provided in Figure 2-2<sup>1</sup>. Note that in Figure 2-2 for N-1 and N-2 conditions, no resonance ( $X=0$ ) occurs but there is a reactance dip created by the resonant, series-compensated path being in parallel to other network impedances (alternate transmission paths). Those reactance dips also correspond to increases in the resistance of the scan, which is directly related to a decrease in the electrical damping at the 60 Hz complementary frequency (i.e.  $60 - f_{scan}$ ) in Figure 2-1.

The important point to notice about the plots in Figure 2-1 is that the risk for TI is not limited to a radial connection between the machine and the series capacitor, but can occur anytime that the electrical damping becomes negative so long as 1) the mechanical mode aligns with the negative electrical damping; and 2) the electrical damping is sufficiently negative to overcome the mechanical damping. To illustrate, two example torsional modes are provided in Figure 2-1 represented by the vertical red, dashed lines, the first is at 21.3 Hz and the second is at 29.7 Hz. The mechanical damping is defined on these lines by the top circle which indicates how low the electrical damping curve must go at the respective frequencies in order to cause a TI condition (i.e. SSR). In all cases, N-0 through N-3, the 21.3

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<sup>1</sup> Strictly speaking the impedance scans are performed up to 120 Hz so that the electrical damping can properly account for both the subsynchronous and super-synchronous complementary frequencies.

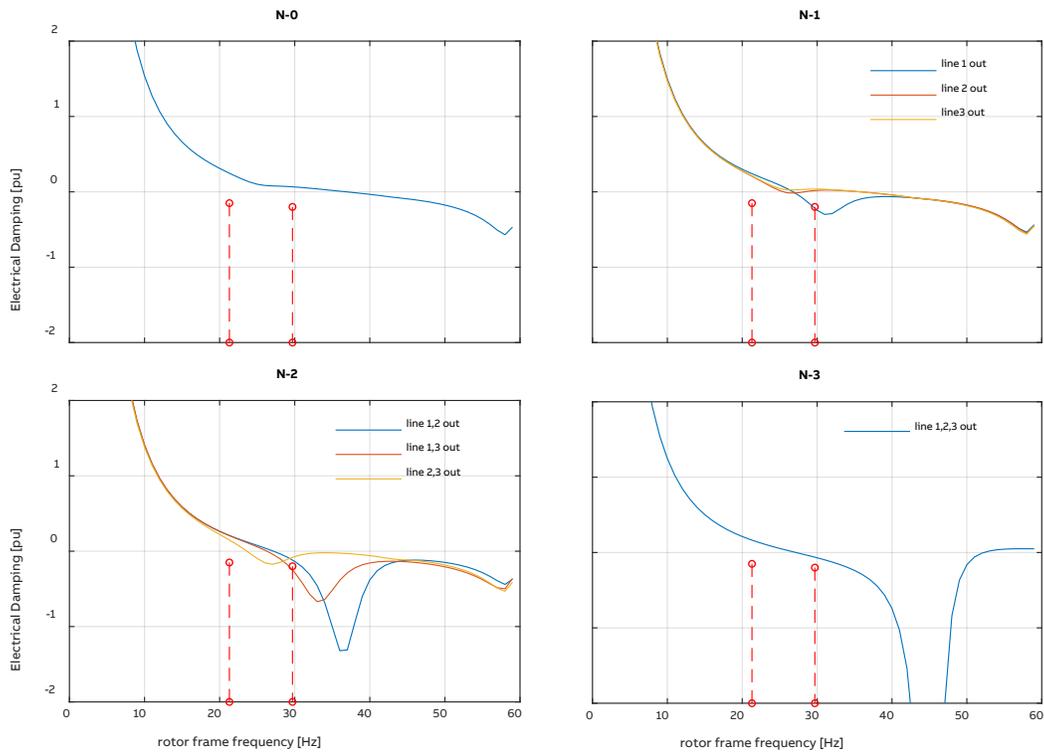
Hz mode is not at risk for SSR. The electrical damping will never overcome the mechanical damping. For the 29.7 Hz mode, however, SSR is likely for N-1 conditions with line 1 out and for N-2 conditions with lines 1 and 3 out, but *not* for radial N-3 conditions.

Considering the various N-2 combinations, note that the minimum of the electrical damping dip shifts frequencies depending of the specific lines that are out. This results in the conclusion that for the 29.7 Hz mode, the only N-2 condition resulting is TI is the simultaneous outage of lines 1 and 3, but there is no TI for the other two N-2 contingencies because *at the mode frequency* the electrical damping is not sufficiently negative. This is true even though the contingency with lines 1 and 2 out has a much deeper negative electrical damping. Care must be taken when considering such conclusions, however, because the mechanical damping is strongly dependent upon the loading of the generator since much of the damping derives from fluid flow (gas or steam) through the turbines. More heavily loaded machines have better mechanical damping requiring even more negative electrical damping to result in SSR conditions.

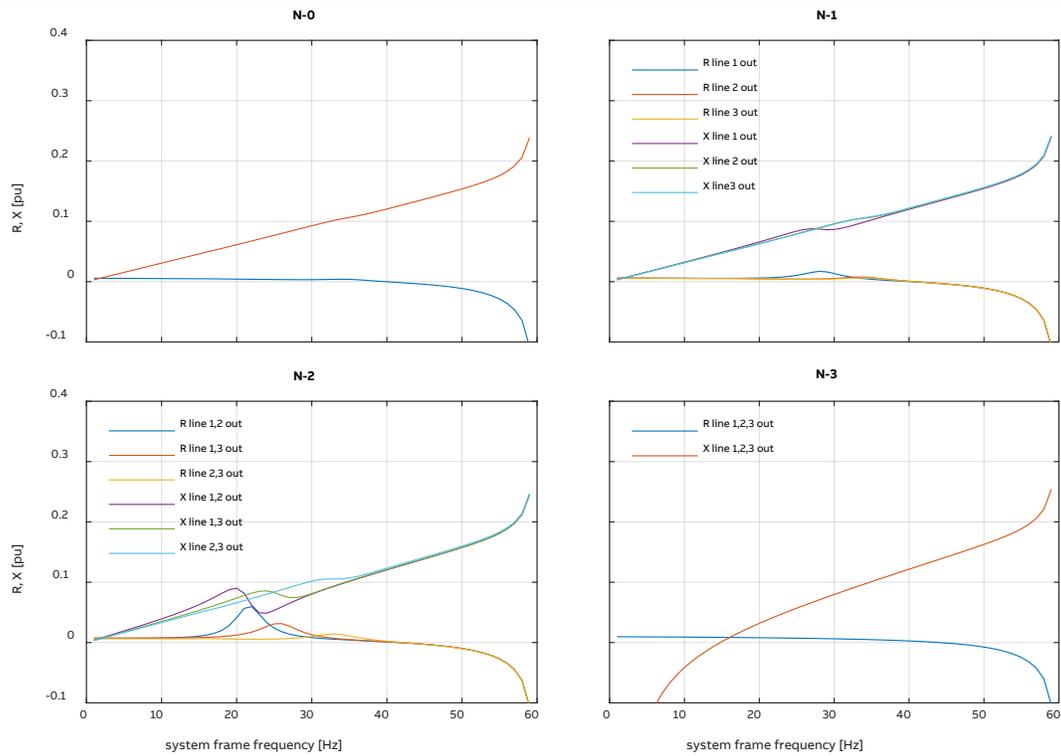
A nuance to these plots is that the N-0 shows negative damping above about 30Hz, but this is characteristic of the generator parameters and no TI is expected under these conditions or the machine would never operate stably even on an intact system.

Another nuance that must be considered for the plants under evaluation here is the influence of neighboring machines. If the other machines in the plant are identical, they will act in sympathy with one another increasing the potential risk for SSR for all of the on-line machines. This is because they share common torsional mode frequencies and act in concert to any disturbance to the system. A similar effect may occur if non-identical machines within the plant or nearby on the system share a common torsional mode frequency. On the other hand, if there are machines at the same plant or nearby on the system that have distinctly different torsional mode frequencies, they provide a more or less mitigating influence on the machines that do not share their torsional mode frequencies. This must be taken into account when considering combined cycle units because the gas turbines (GTs) typically have different modes than the steam turbines (STs). The operation of the GTs in simple cycle mode must be considered as well as the combined cycle modes with both GTs and steam turbines on-line.

While all machines can differ, it has been ABB's experience that GTs typically have one (1) subsynchronous torsional mode that is usually in the range of 20 to 22 Hz (rotor frame), while the accompanying STs usually have two or three subsynchronous modes with only one of them having sufficiently low mechanical damping to present significant concern for SSR. These modes range from 21 Hz to 50 Hz (rotor frame). The torsional modes of the STs and the GTs need only differ by about 0.5 Hz or less to begin providing a mitigating influence to each other, although in some cases torsional modes that are separated by less than 2 Hz may result in a "beat" in the torques on the machines.



**Figure 2-1: Electrical damping curves for example generator that becomes radial to series compensation under N-3 conditions**



**Figure 2-2: Impedance scans for example generator that becomes radial to series compensation under N-3 conditions**

## 2.3 Torque Amplification

While the method used in [1] for screening for torque amplification is a typical method within the industry, it is, in ABB's experience, highly conservative. That is, it often indicates potential TA concerns under conditions for which actual TA is unlikely to occur. In addition, the representation of the machine impedance in the effort is not clear, so the conclusions cannot be fully commented upon.

Torque Amplification is a phenomenon that is strongly related to the resonant conditions observed from the machine immediately prior to application of, or immediately following the clearing of a fault. It is typically quite sensitive to fault location as well. If there is any concern about TA for a given plant, *ABB strongly recommends a detailed study (in an electromagnetic transients program such as PSCAD) that considers such issues along with the model of the machine shaft.*

If TA is observed, very careful evaluation of the transient simulations in comparison to a Stress-Number (S-N) curve should be considered to estimate shaft loss-of-life. This assumes that an S-N curve can be obtained from the machine manufacturer.

### 3 Generating Facility Descriptions

NYISO requested SSR mitigation cost estimates for two sets of generating facilities:

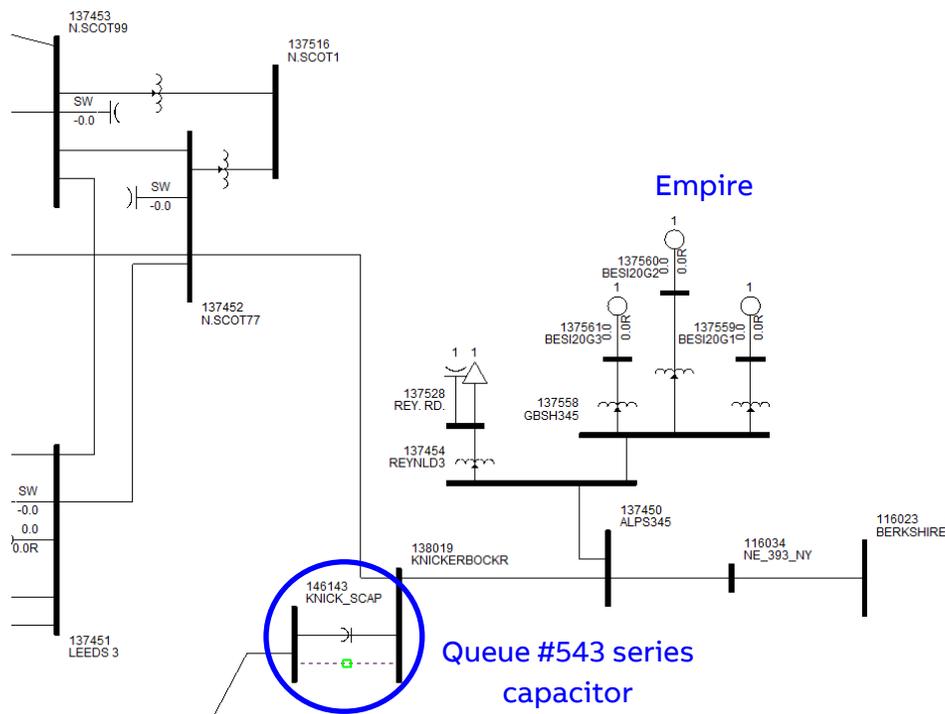
1. Empire
2. Empire, Athens and Cricket Valley

The plant descriptions and their association with the Queue #543 series capacitor are provided below.

#### 3.1 Empire

The Empire plant is the same as identified in [1] as Besicorp. The plant is comprised of three generators, two of which are rated at 223 MVA and one which is rated at 358 MVA. As shown in Figure 3-1, the plant is electrically close to the Queue #543 series capacitor and can achieve a fully radial connection with the simultaneous loss of three (3) elements:

1. Alps – Berkshire 345 kV line
2. New Scotland – Knickerbocker 345 kV line
3. Reynolds Road 345/115 kV transformer



**Figure 3-1: New York transmission system in the vicinity of the Empire generation facility and Queue #543 series capacitor.**

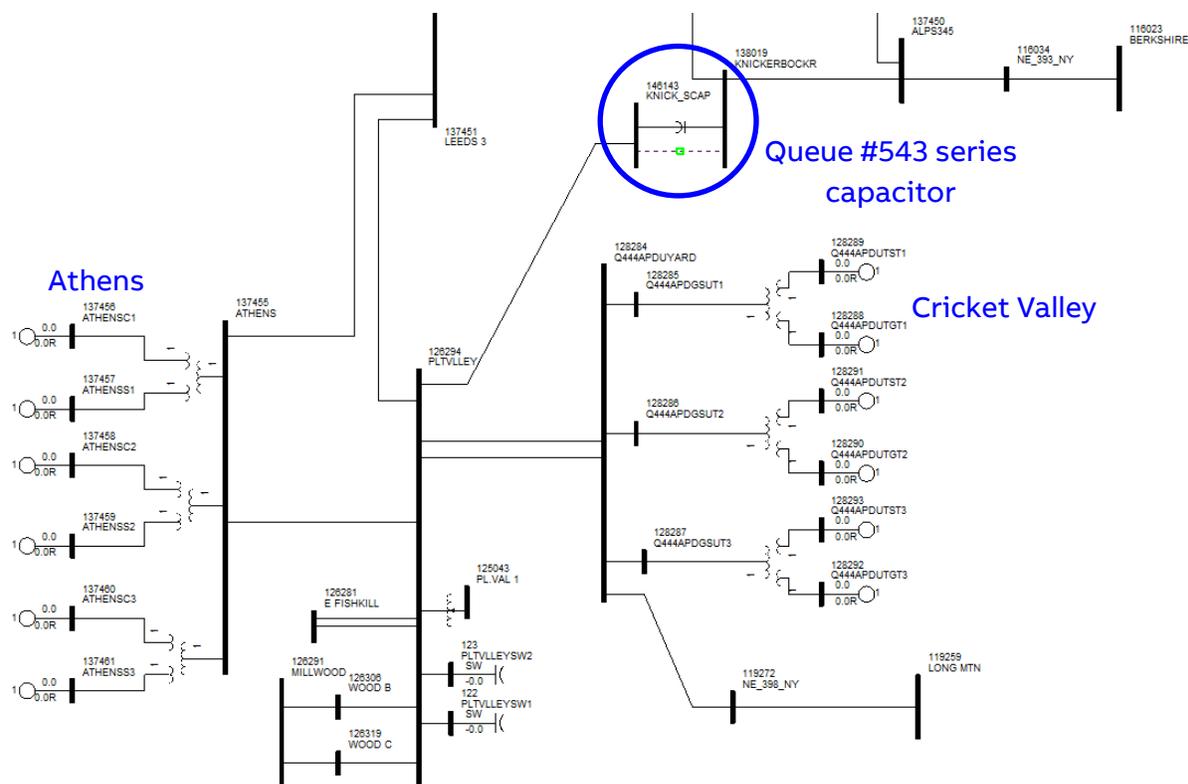
A cursory review of the system suggests that the Reynolds Road transformer will have little impact on potential for TI on these machines. On the other hand, the system beyond New Scotland has a stronger short-circuit capacity than the Massachusetts system connected beyond Berkshire, suggesting that it will have the greatest influence on TI. Nevertheless, it is probable that the loss of either of these 345kV lines has the potential of exposing the

plant to TI risk. In other words, there is a strong likelihood that the plant may be exposed to TI under N-1 or N-2 conditions and a more rigorous evaluation is recommended to help establish the operational mitigation measures that are most critical.

When doing so, as much detail about the plant as available should be considered. The plant configuration strongly suggests a combined cycle plant with two gas turbines (GTs) and one steam turbine (ST). As such it is likely, but not certain, that the GTs will provide some amount of mitigation to the ST and the ST will provide some amount of mitigation to the GTs assuming the different turbine types do not share a common torsional mode frequency. If this is the case, the most sensitive condition will be when the two GTs are on-line together and operating in the simple cycle mode.

### 3.2 Athens and Cricket Valley

The Athens and Cricket Valley generating facilities connect to the Queue #543 series capacitor via the Pleasant Valley 345 kV bus, as illustrated in Figure 3-2.



**Figure 3-2: New York transmission system in the vicinity of the Athens and Cricket Valley generation facilities and the Queue #543 series capacitor.**

Both facilities are combined cycle plants, with three GT/ST pairs each. Based on the PSS/E data, each pair is on a three-winding GSU. At Athens the GTs are 318 MVA and the STs are 161 MVA. At Cricket Valley the GTs are 278 MVA and the STs are 205 MVA.

The outages needed to create a radial connection to the series capacitor will depend on how the plants are being, or need to be, treated. If both Athens and Cricket Valley have generators with identical torsional modes (which is highly unlikely given the differences in

machine ratings) then they can properly be treated as sister plants that are expected to sympathize with each other. In that case, the following outages are necessary to place both plants radial to the series capacitor:

1. Pleasant Valley 345/115 kV transformer
2. Pleasant Valley – Wood B 345 kV line
3. Pleasant Valley – Wood C 345 kV line
4. Pleasant Valley – East Fishkill 345 kV circuit 1
5. Pleasant Valley – East Fishkill 345 kV circuit 2
6. Pleasant Valley – Leeds 345 kV line
7. Cricket Valley – Long Mountain 345 kV line
8. Athens – Leeds 345 kV line

These outage together would result in an N-8 contingency, which is an extremely rare occurrence which would probably prevent the plants from continuing to operate at full capacity. Even so, as has been discussed extensively before, TI may occur under contingencies far less severe than this. If all of the GTs are on line in simple cycle mode, then based on experience it might reasonably be expected that TI would be a concern under N-3 or higher conditions.

However, because of the differences in the machine ratings and the likely differences in torsional mode frequencies, the more reasonable approach would probably be to evaluate the plants separately. In this case the outages to make the Athens plant radial to the series capacitor would be:

1. Pleasant Valley 345/115 kV transformer
2. Pleasant Valley – Wood B 345 kV line
3. Pleasant Valley – Wood C 345 kV line
4. Pleasant Valley – East Fishkill 345 kV circuit 1
5. Pleasant Valley – East Fishkill 345 kV circuit 2
6. Pleasant Valley – Leeds 345 kV line
7. Pleasant Valley – Cricket Valley 345 kV circuit 1
8. Pleasant Valley – Cricket Valley 345 kV circuit 2
9. Athens – Leeds 345 kV line

And, the outages to make the Cricket Valley plant radial to the series capacitor would be:

1. Pleasant Valley 345/115 kV transformer
2. Pleasant Valley – Wood B 345 kV line
3. Pleasant Valley – Wood C 345 kV line
4. Pleasant Valley – East Fishkill 345 kV circuit 1
5. Pleasant Valley – East Fishkill 345 kV circuit 2
6. Pleasant Valley – Leeds 345 kV line
7. Pleasant Valley – Athens 345 kV line
8. Cricket Valley – Long Mountain 345 kV line

Without an appropriate study that account for the system electrical damping and the torsional modes of the generators involved, it is very difficult to say which of these outages

is most critical, but based on the fault current contributions at the Pleasant Valley 345kV bus, it would appear that the most influential will be the connections to East Fishkill and to the other generating facilities – Cricket Valley when considering Athens and Athens when considering Cricket Valley. The loss of connections to Wood are also expected to contribute significant influence on SSR. All of this means that the potential outage configurations leading to SSR concerns may be a long and complex list.

## 4 Requested SSR Mitigation Options

This section specifically discusses the SSR mitigation options NYISO requested be evaluated.

### 4.1 Option 1 – SSR Protective Relays at Generators

#### 4.1.1 Option 1 Description

The first SSR countermeasure option requested for evaluation is the use of “fully redundant protective relays to detect an SSR condition at the impacted generator(s) and trip the impacted generator(s).” This is illustrated for each plant in Figure 4-1.

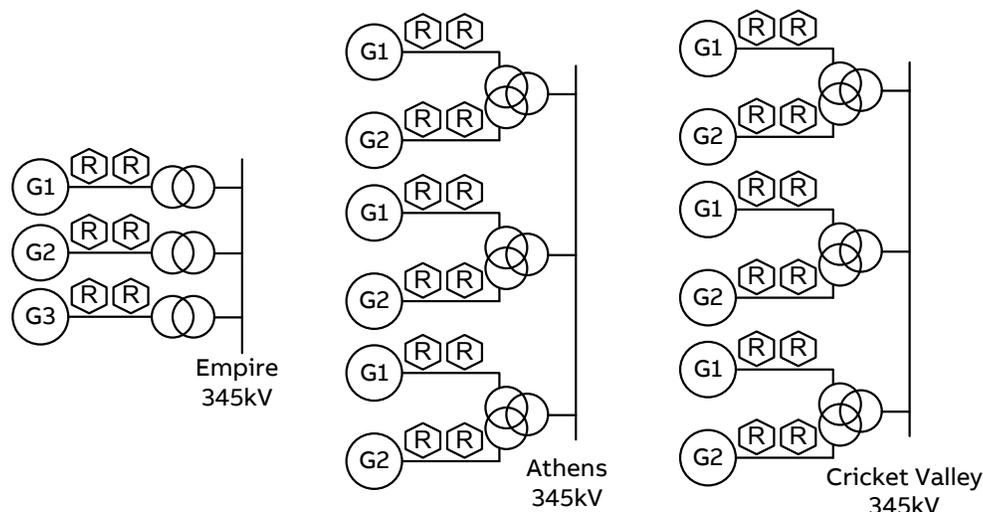


Figure 4-1: Option 1 Configuration at each generating plant.

While the few manufacturers that provide SSR relay functions may have differing approaches, ABB’s approach is to detect the presence of SSR in the electrical output of the generator. The current or voltage at the terminal of the generator is measured and analyzed to determine the presence of the specific subsynchronous modal frequencies of the protected generator. If these subsynchronous quantities reach a level of concern, the generator is tripped. It has been ABB’s experience that for direct generator protection it is best to monitor the terminal voltages for this protective function ([3]).

Please note that it is ABB’s standard practice to recommend direct generator protection as back-up protection for any instance in which there is a reasonable risk of SSR/TI to a generator in the unlikely event that other mitigation measures fail. This option is not typically recommended as the primary SSR countermeasure. As such, ABB recommends that – regardless of other mitigation options that may be selected – SSR relays be placed on all generators that are shown through adequate study to be at risk to SSR concerns and specifically to TI. When used as back-up protection redundant relays are not considered to be necessary, since they back-up other mitigation measures that are likely to be redundant.

### 4.1.2 Option 1 Pros and Cons

The most obvious benefit to this option is the local and immediate protection of the generators from a phenomenon that can potentially result in catastrophic damage to the machines. This option also allows for a specific targeting of the unique characteristics of the machine being protected – that is, each relay can be tuned to the specific torsional modes that studies have determined will need to be monitored. This allows the generation to be tripped only if there is a direct risk to the machine itself. For example, in the combined cycle plants being considered, if an ST comes under an SSR condition but the companion GTs do not, it may only be necessary to trip the ST. Of course, if the situation is reversed such that the GTs are under an SSR condition but the ST is not, the ST will also need to be tripped.

The main drawback to Option 1 is that it trips the generation. If it is found that SSR is at risk under a low number of transmission outages, the generation may trip often depending on how frequently the critical line(s) trip. This may be of concern for the Empire facilities since it requires very few outages to place the facilities directly radial to the series capacitor. It is less likely to be of concern for either the Athens or the Cricket Valley plants.

It is noted that the number of relays required to protect a single generator will depend on the number of torsional mode frequencies to be monitored. If there are three or less torsional modes to be monitored on a given machine, then a single relay should be sufficient for that machine. If more torsional modes are of concern, additional relays may be needed to monitor all of the modes.

### 4.1.3 Option 1 Cost Estimate

The following budgetary cost estimates assume that a single relay is sufficient for each machine and redundant relays have been provided. They are approximate installed costs.

#### ***Empire Facilities***

- Study to define generator characteristics and relay settings: \$70k - \$100k
- Redundant relays and panels for 3 generators: \$534k

#### ***Empire/Athens/Cricket Valley Facilities***

- Studies to define generator characteristics and relay settings: \$125k - \$175k
- Redundant relays and panels for 15 generators: \$2.3M

## 4.2 Option 2 – SSR Detection at Generators, Series Capacitor Bypass

### 4.2.1 Option 2 Description

The second option requested for evaluation is “fully redundant protective relays to detect an SSR condition at the impacted generator(s) and to initiate a signal to bypass the series compensation.” This option is illustrated in Figure 4-2.

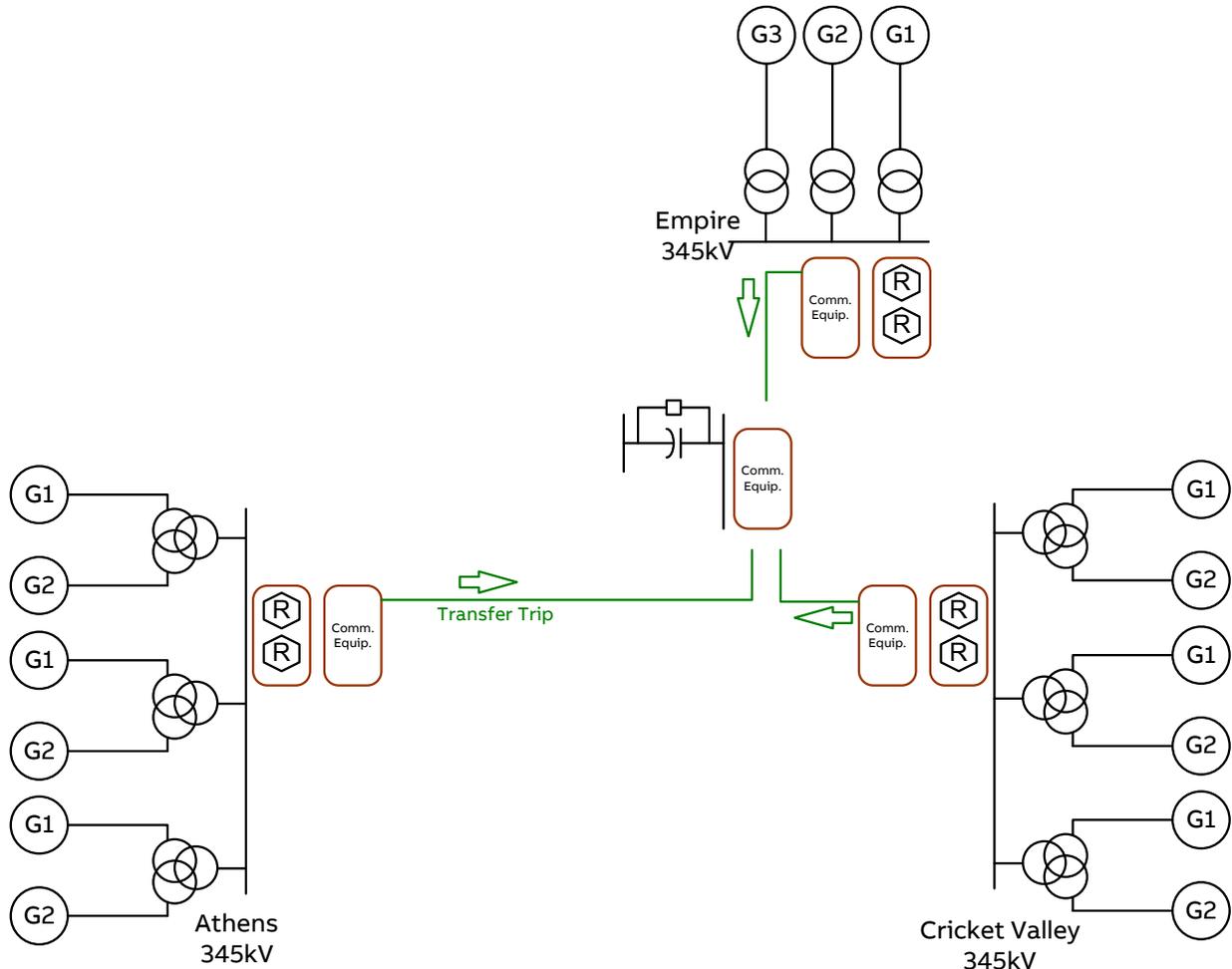


Figure 4-2: Option 2 Configuration.

This differs somewhat from Option 1 in that the focus is on detecting any SSR condition at the plant, which a single relay may be able to detect given the number of lighter damped subsynchronous modes in typical combined cycle units.

### 4.2.2 Option 2 Pros and Cons

The primary benefit to Option 2 is that a single set of redundant relays at each plant may be able to achieve the goals of the mitigation. In ABB’s experience GTs tend to have only one subsynchronous torsional mode, while the companion STs tend to have two or three subsynchronous modes with one of those being highly damped or having a very low generator participation factor (the system cannot influence these modes significantly). At

each generating plant, this means that there are likely to be only two or three modes that require monitoring. Further, more complete studies may show that only one of these modes at each plant is at risk for destabilizing SSR under any of the outage conditions.

The primary drawback to Option 2 is that it trips the series capacitor under contingency conditions in which generators are still producing. The typical purpose for a series capacitor is to improve the transfer capability of a transmission path and suddenly reducing this capability under contingency conditions (often exactly when it is desirable to have it) may lead to system stability concerns unless generation is simultaneously reduced.

A second potential drawback is the requirement for communications to initiate the transfer trip. In order to accomplish the trip, the communications must be reliable and intact, or the mitigation measure will fail.

Of the six options requested by NYISO for evaluation, ABB ranks this as the second best option for consideration.

### *4.2.3 Option 2 Cost Estimate*

#### *Empire Facilities*

- Study to define generator characteristics and relay settings: \$70k - \$100k
- Redundant relays and panels for 1 bus: \$480K
- Back-up generator relays and panels for 3 generators: \$325K

#### *Empire/Athens/Cricket Valley Facilities*

- Studies to define generator characteristics and relay settings: \$125 - \$175k
- Redundant relays and panels for 3 buses generators: \$1.5M
- Back-up generator relays and panels for 15 generators: \$1.6M

## 4.3 Option 3 – Resonant Blocking Filters

### 4.3.1 Option 3 Description

The third option requested for evaluation is the use of a “resonant blocking filter in series with the impacted generator(s).” This option appears to be that described in [4] for the Navajo project in the mid 1970’s and in [2] (pg. 260). This mitigation measure places a separate tank filter for each mode to be mitigated at the neutral side of each phase of the GSU high-voltage winding. The neutral side of the high-voltage winding is selected because it is the point of lowest current and voltage requirements for the filter equipment. An example arrangement, which assumes two torsional modes to be mitigated, is illustrated in Figure 4-3. The components are selected such that there are low losses added at fundamental frequency, but sufficient damping is added at the torsional mode frequencies to help damp the transient torques (i.e. reduce TA).

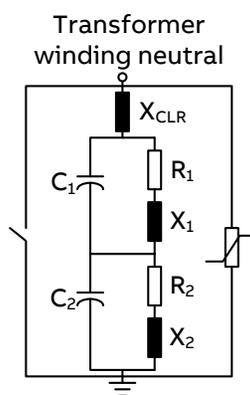


Figure 4-3: Series blocking filter for two torsional modes.

### 4.3.2 Option 3 Pros and Cons

Benefits to the resonant blocking filter include the fact that it passively mitigates the SSR issues. Simulations for the Navajo installation showed it to be effective in addressing both TI and TA ([4]).

On the other hand, several potential drawbacks should be considered. First, the GSU must be designed to accept the connection of the filters at the neutral end of each primary winding. If the GSUs have not yet been designed, this can be more readily addressed, but on existing plants it may mean the replacement of the GSUs. The transformer design must also include a higher BIL since the neutral voltage will be raised during any transient event that may result in the generation of the torsional mode frequencies.

In addition, consideration must be given to the detuning of the filters that occurs due to temperature variations and capacitor can losses. Further, the performance of the filters during system swings and other operation at off-nominal frequencies must be evaluated during the design stage to assess the adequacy of the filter performance.

It is noted that this solution is not, as ABB understands it, a standard solution within the industry. This may be due to several reasons including potential difficulties in assuring filter

performance under the variations described above and the associated liability for poor performance.

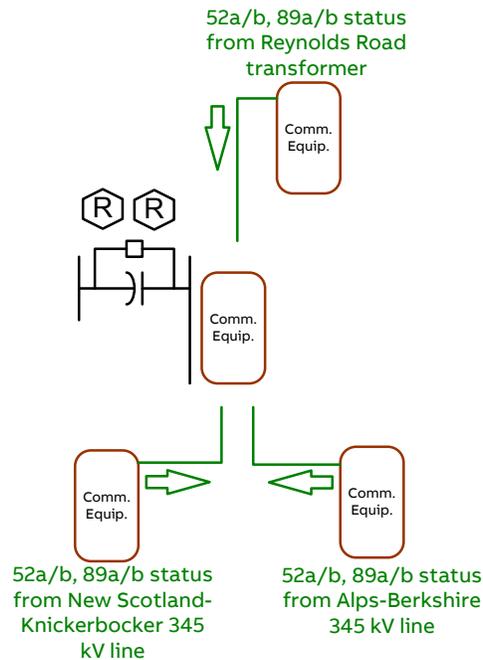
### *4.3.3 Option 3 Cost Estimate*

ABB does not supply this solution as an SSR mitigation measure and cannot comment on the budgetary cost.

## 4.4 Option 4 – Remedial Action Scheme No. 1

### 4.4.1 Option 4 Description

The fourth option specifically requested for consideration is a “fully redundant Remedial Action Scheme to bypass the series compensation when all combinations of critical transmission outages that lead to SSR become out of service.” The option is illustrated in Figure 4-4.



**Figure 4-4: Option 4 Configuration.**

This option appears to be based on [1], which concluded that the only SSR issues associated with the interconnection of the Queue #543 project occurred under the N-3 contingency of the following elements:

1. Alps – Berkshire 345 kV line
2. New Scotland – Knickerbocker 345 kV line
3. Reynolds Road 345/115 kV transformer

ABB does not recommend this solution as stated. As indicated in Section 2.2, it is reasonably possible for Torsional Interaction between the series capacitor and the generating facilities – especially the Empire generation – to occur under N-1 or N-2 conditions, but not under N-3. It is also possible that there is ultimately no concern for TI at all. The ultimate risk and ultimate mitigation will depend on the interaction of the torques created by the electrical and mechanical systems at specific frequencies.

If Option 4 is to be considered, then it is actually more complex than stated above. The logic would have to be established so that any combination of the three elements (for Empire) *that has been shown to lead to SSR conditions* would initiate a bypass of the series capacitor. For example, a bypass may need to be initiated when element 2 from the above

list is out alone, and also when elements 1 and 3 are out simultaneously, but perhaps not when elements 1 and 3 are out on their own, nor when element 2 is out simultaneously with one of the others, nor when all three elements are out together.

#### *4.4.2 Option 4 Pros and Cons*

It should be noted that this approach requires that additional communications be established between the substations involved and the series capacitor. Since the series capacitor is near/at the Knickerbocker 345 kV station it is reasonable to establish communications from the Alps and Reynold Road substations for the Empire contingencies and from the Pleasant Valley, Athens and Cricket Valley substations for the other contingencies. The increased communication requirements will add complexity to this solution.

Another drawback to this solution is the same as any option that relies on bypassing the series capacitor; namely, bypassing the series capacitor may detrimentally impact the system's stability under the contingencies involved.

It is noted that this approach has been attempted in at another installation within NY. It is ABB's understanding that communication failures resulted in numerous instances of nuisance bypassing of the series capacitors. Due to this, the approach is being changed to a blended solution involving Option 4 and Option 6.

#### *4.4.3 Option 4 Cost Estimate*

##### *Empire Facilities*

- Study to define generator characteristics and relay settings: \$30k - \$50k
- Redundant relays and communication panels for 3 buses: \$515k
- Back-up generator relays and panels for 3 generators: \$325k

##### *Empire/Athens/Cricket Valley Facilities*

- Studies to define generator characteristics and relay settings: \$50 - \$75k
- Redundant relays and communication panels for 6 buses: \$620k
- Back-up generator relays and panels for 15 generators: \$1.6M

## 4.5 Option 4a – Remedial Action Scheme No. 2

### 4.5.1 Option 4a Description

The next option requested for evaluation is a “fully redundant Remedial Action Scheme to bypass the series compensation when only local critical transmission paths at the Knickerbocker substation that could lead to SSR become out of service.” The option is similar to Option 4 but the remedial action scheme is limited to only the Knickerbocker substation. It is illustrated in Figure 4-5 assuming that the communications for the breaker status at the far end of the critical transmission paths are already available.

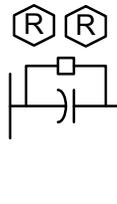


Figure 4-5: Option 5 Configuration.

### 4.5.2 Option 4a Pros and Cons

This option is much easier to implement than Option 4 because it relies only on communications at the local station (it is assumed that this includes information on the breaker status at the far end of the critical path). Care must be taken, however, to ensure that any conditions that involve SSR are all contingent upon the outage of the local lines connected to the Knickerbocker substation. Torsional Interaction can have complicated behavior because the outages of different lines will result in a shifting of the frequencies at which negative electrical damping from the system occur. This may mean, for instance, that the outage of the local line is actually the event that prevents TI from occurring with the local generation.

The effectiveness of this option must be determined by further study to identify the critical contingencies that may lead to SSR. If the critical contingencies do indeed always involve lines connected to the Knickerbocker substation, then this option would be effective and the ease of implementation may be desirable. The more comprehensive approach when considering remedial action schemes is that indicated as the alternate for Option 4; namely, use the complex logic necessary to detect those contingency conditions that have been demonstrated to lead to SSR concerns. This will require the additional communications and logic which Option 5 seeks to eliminate, but based on the cursory evaluations performed to date, Option 5 is not guaranteed to be sufficient to mitigate the SSR issues with the Empire generating plant.

And, of course, this option raises the concern that bypassing the series capacitor may detrimentally impact the system’s stability under the contingencies involved.

### 4.5.3 Option 4a Cost Estimate

#### ***Empire Facilities***

- Study to define relay settings: \$30k - \$50k
- Relay programming for 1 bus: \$210k
- Back-up generator relays and panels for 3 generators: \$325k

#### ***Empire/Athens/Cricket Valley Facilities***

- Studies to define relay settings: \$30k - \$50k
- Relay programming for 1 bus: \$210k
- Back-up generator relays and panels for 15 generators: \$1.6M

## 4.6 Option 5 – SSR Detection at Series Capacitor, Series Capacitor Bypass

### 4.6.1 Option 5 Description

The final option specifically requested for evaluation is a “fully redundant Remedial Action Scheme to close the bypass breaker on the series compensation when SSR conditions are detected by the special SSR relays at the series compensation device.” The option is illustrated in Figure 4-6.

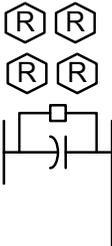


Figure 4-6: Option 6 Configuration.

This option will rely on the detection of SSR currents or voltages at the series capacitor. The SSR detection function using electrical parameters indicates that it will either be incorporated in the series capacitor control system (which often do not have the desired measurement resolution) or will be added by an appropriate relay integrated to the series capacitor facilities.

### 4.6.2 Option 5 Pros and Cons

The primary benefit of this option is that it allows detection of SSR conditions at the series capacitor itself, eliminating complex communications and relay logic. The solution is fairly elegant but may have some complexities for implementation. If tuned just for the Empire facilities, only the SSR frequencies expected to be produced by those generators need be monitored. This can likely be accomplished with the basic configuration of the appropriate ABB relay. If it becomes necessary to tune the protection to cover Empire, Athens and Cricket Valley (or any combination) the number of frequencies may increase to a level in which more than one relay will be required to detect all of the frequencies of concern.

Establishing the correct settings for the relays is expected to be somewhat challenging to ensure protection of all of generation facilities before damage occurs. This will require careful study. Preliminary evaluations suggest that the network conditions that create a potential SSR condition also result in a condition in which the SSR currents are approximately equal to or are amplified above those at the generator plant primary bus. This suggests that it may be as easy to detect SSR currents at the series capacitor as at the plant bus in Option 2. Complexities around this associated with protecting multiple plants need to be explored.

A complication in determining the actual pick-up settings for the relays arises from the sympathetic behavior of identical machines. Consider the situation when both Empire GTs are operating in simple cycle mode under an SSR condition. Both will respond with growing

torques producing SSR currents that are likewise increasing in magnitude. The relay at the series capacitor must be set such that

- Series capacitor bypass is initiated before shaft damage is expected to occur on either GT shaft;
- False tripping does not occur when the SSR frequencies are detected due to a large disturbance that is not SSR.

The setting needed to achieve the desired results may then be too high to bypass the series capacitor when only one GT is operating and producing half the current into the series capacitor for the same torque on the individual generator. On the other hand, if the relay setting is such that the single GT is protected, then it may be too low for normal, damped disturbances such as faults near the generators. Ultimately, a careful study will be required to establish the relay settings even if mitigation is only needed for a single generating facility, such as Empire.

Like many other options, this option also raises the concern that bypassing the series capacitor may detrimentally impact the system's stability under the contingencies involved.

Of the six options requested by NYISO for evaluation, ABB ranks this as the best option for consideration.

#### *4.6.3 Option 5 Cost Estimate*

##### *Empire Facilities*

- Study to define relay settings: \$100k - \$150k
- Redundant relays and panels for 1 bus: \$400k
- Back-up generator relays and panels for 3 generators: \$325k

##### *Empire/Athens/Cricket Valley Facilities*

- Studies to define relay settings: \$125k - \$175k
- Redundant relays and panels for 1 bus: \$400k
- Back-up generator relays and panels for 15 generators: \$1.6M

## 5 Additional SSR Mitigation Options

There are several options that are not included in the previous discussion which may be worthy of consideration. These are discussed individually below.

### 5.1 Supplementary Damping Controller

With some excitation systems, a supplementary damping control signal can be added to the field voltage to apply torque to the machine in manner that yields positive damping to the torsional modes. This option is somewhat limited because the excitation system must allow for the injection of an additional signal. Further, in the systems that have utilized the excitation system for damping, the input signal has been taken from the machine torsional motion. To get this signal, additional equipment (tooth wheels or laser measurements) may need to be added to the generator.

### 5.2 Dynamic Stabilizer

A dynamic stabilizer is an active shunt device connected close to the generator terminals which is controlled in a manner that currents from the device add a sufficient level of electrical damping on the machine to help prevent undamped TI. Such a device has been rarely used in the past and has not been an industry standard solution with commercialized products. The devices have in the past have been very similar to SVCs, but ABB sees no reason that a STATCOM utilizing a voltage source converter would not be able to provide the same functionality and may, perhaps, provide better control for an SSR damping function.

### 5.3 Series Capacitor Modifications

While it may be too late to adjust the design of the Queue #543 series capacitor, for future reference, there are several options to the series capacitor design that can be considered for SSR mitigation. These include:

- 1) Segmented Series Capacitor
- 2) TCSC
- 3) SC Damping Filter

#### 5.3.1 Segmented Series Capacitor

A change in the design of a series capacitor is possible such that the series compensation is provided in multiple segments with the individual bypass of each segment being possible. For example, consider the two segment configuration illustrated in Figure 5-1.

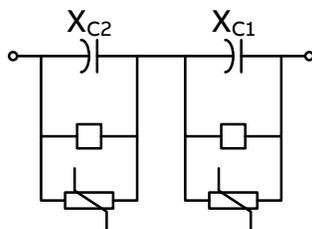


Figure 5-1: Segmented series capacitor configuration

The total compensation provided by both segments is  $(X_{C1}+X_{C2})/X_{Line}$ , but a reduced compensation level can be obtained through bypassing one of the segments. When this happens the frequency of the potential SSR will change – to a higher frequency as seen from the machine rotor (i.e. rotor reference frame) and to a lower frequency when viewed from the generator terminals. If the shift is to a frequency that is free from TI risk for any of the proximate generators, then the SSR is mitigated without removing the entirety of the series compensation. If bypassing the entire capacitor would result in system instabilities, bypassing only a portion of the capacitor may provide a stable system response.

The drawbacks of this arrangement are an increase in platform area, more complex controls, an increase in the equipment components required (e.g. additional breakers and MOVs), and the associated costs.

### 5.3.2 Thyristor Controlled Series Capacitor (TCSC)

The TCSC is a well-established device that has many installations across the world, with some installations being put in place specifically to address SSR issues that would otherwise occur with fixed series capacitors. The basic configuration of a TCSC (ignoring the protection) is shown in Figure 5-2.

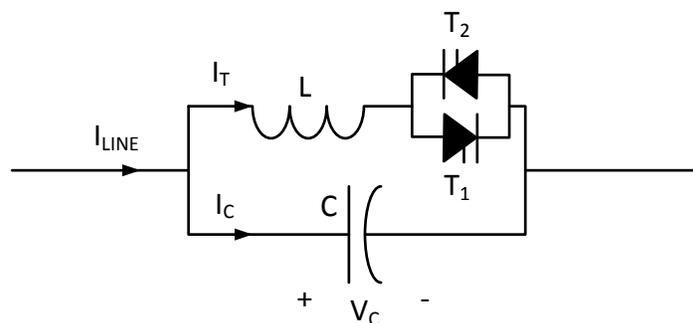


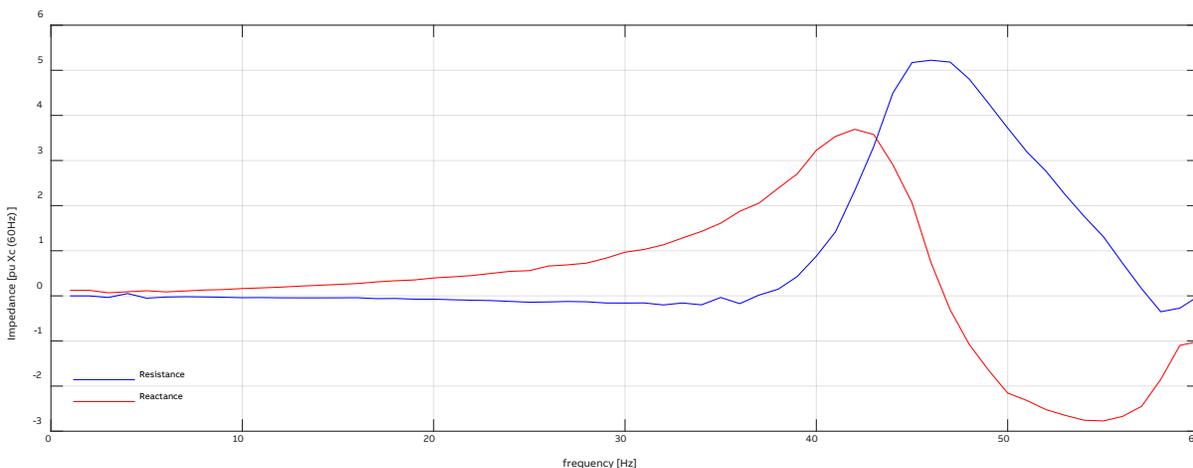
Figure 5-2: Basic TCSC Topology

The primary purpose of the TCSC is to allow for the Vernier control of the series compensation level within a limited range. The thyristor switching is controlled in a manner that boosts the voltage across the capacitor due to the transient pulse that occurs in the resonant LC circuit. Since the line current remains unchanged, the increased voltage creates an effectively larger capacitance.

When properly controlled, the TCSC has the added benefit of appearing inductive over the majority of the subsynchronous frequency range. This means that SSR cannot occur over the frequency range where the TCSC appears inductive. The effective impedance of an example TCSC is shown in Figure 5-3 for illustration<sup>2</sup>. In this instance, the effective impedance is inductive until approximately 48 Hz, which means that no SSR can occur with torsional modes of 12 Hz or higher. Whether or not SSR can occur with lower frequency

<sup>2</sup> ABB uses a patented synchronous voltage reversal (SVR) control scheme that allows for improved SSR performance and for the characteristics shown in Figure 5-3.

torsional modes depends upon the individual machines and the interconnected system under its various possible configurations, but other issues are involved and, to date, no SSR has occurred with a properly controlled TCSC.

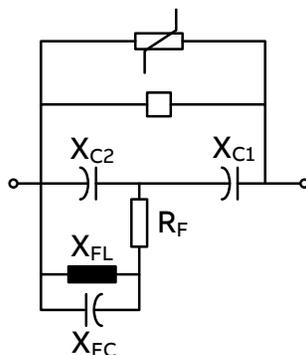


**Figure 5-3: Effective TCSC impedance**

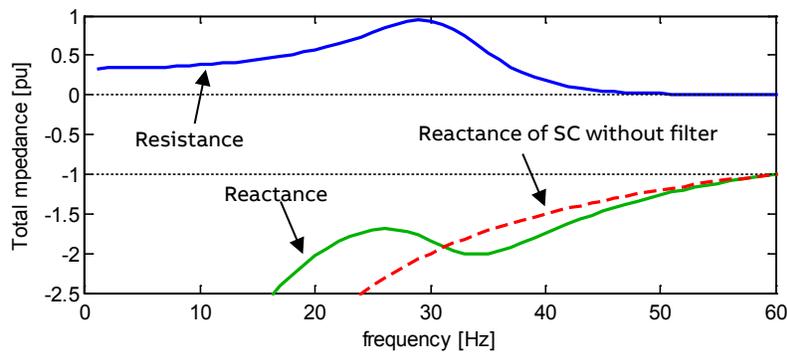
The TCSC is, of course, much more complex than a passive fixed series capacitor, requires additional platform, controls and equipment, and has a higher price than a fixed series capacitor.

### 5.3.3 Series Capacitor Bypass Damping Filter

The philosophy behind the bypass damping filter is not unlike that leading to the use of series blocking filters at the generator GSU, but its application is at the series capacitor itself and the filter is designed to block fundamental frequency currents through the filter instead of SSR currents. A general configuration is shown in Figure 5-4. The filter across series capacitor segment  $X_{C2}$  is tuned to block fundamental frequency currents. This allows the SSR currents to pass through the filter and allow the added filter resistance to add damping at those frequencies. A typical impedance characteristic plot is shown in Figure 5-5. As can be seen in the plot the resistance of the combined series capacitor/filter is fairly high across a broad spectrum of frequencies dropping off between 30 Hz and 40 Hz.



**Figure 5-4: Series capacitor bypass damping filter configuration**



**Figure 5-5: Series capacitor bypass damping filter impedance characteristics**

There is limited experience with such a device and ABB is aware of only a single project in which the filters have been implemented (GE holds a patent on the concept). Nevertheless, it appears in ABB’s view that it may be an effective means of SSR mitigation if the design is adjusted to appropriately address the torsional modes of the nearby machines.

The configuration in Figure 5-4 shows the filter across only a portion of the series capacitor, but it need not be limited to this, and it is possible to develop a design that will give characteristics that are quite similar to the TCSC. However, there are some design concerns that must be addressed, which are similar to those of the series blocking filters, namely that changes in capacitance due to temperature and capacitor-can failures, with the associated detuning, must be considered. System frequency deviations must be considered also. The tuning of the bypass filter would typically be done for nominal system frequency, but as the system frequency deviates from nominal the losses in the filter may become quite large. Even at nominal frequency, the filter “tank” circuit circulates fundamental frequency currents and a low quality inductor may result in very high losses.

## 6 References

- [1] *Queue #543 Sub-Synchronous Resonance Screening Study*, Burns & McDonnell Engineering Company, Project No. 74300, Revision 1.3, 9/17/2018.
- [2] *Series Compensation of Power Systems*, P.M. Anderson, R.G. Farmer, PBLSH!, Inc. Encinitas, California, 1996.
- [3] “Design Challenges for Numerical SSR Protection,” Zoran Gajic, et al, Cigre Study Committee B5 Colloquium, Sep 20-26, 2015, Nanjing, China.
- [4] “Navajo Project Report on Subsynchronous Resonance Analysis and Solutions,” R.G. Farmer, A.L. Schwalb, IEEE Transactions on Power Apparatus and Systems, Vol. PAS-96, No. 4, July/August 1977, pp. 1226-1232.