

**NextEra Energy Transmission New York, Inc.**

**(NEETNY)**

**Empire State Line**

**(ESL)**

**Case 18-T-0499**

**Appendix I**

**Quality Control Plan**

**June 2020**



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**Attachment 1 – Steel Pole Installation Checklist**

NEETNY will design, engineer and construct the Empire State Line (ESL) Project in accordance with applicable and published planning and design standards and best engineering practices of the New York Independent System Operator (NYISO), New York State Reliability Council, the Northeast Power Coordinating Council, the North American Electric Reliability Corporation and successor organizations. Additionally, NEETNY will design, engineer and construct Network Upgrade Facilities as defined in Attachment P of the NYISO's Open Access Transmission Tariff in accordance with its Interconnection Agreement(s) and all applicable planning and design standards and best engineering practices of the Connecting Transmission Owners.

The Quality Control Plan is divided into three main areas of responsibility: (1) Design, (2) Construction, and, (3) Materials.

### **Design QA**

- 1) NEETNY has a Construction Supervisor and Quality Assurance Inspector that is responsible for field inspection of the construction plans including staking, survey, alignment and component installation to ensure construction compliance and conformance;
- 2) NEETNY's Quality Assurance Inspector will establish check points and where appropriate, hold points for signoff;
- 3) The Quality Assurance Inspector will schedule and attend all construction progress meetings; and,
- 4) Approved changes/revisions will be tracked via Construction Contractor required red-line markups and shall produce final As Built drawings and documentation.

### **Construction QA**

- 1) The Construction Supervisor will monitor all aspects of construction for conformance with the Environmental Management and Construction Plan (EM&CP) and Detailed Design IFC. The following positions will make up the base staff:
  - a. Construction Supervisor(s)/Chief Inspector(s)
  - b. Quality Assurance Inspector

- c. Safety Inspector
  - d. Environmental Monitor
  - e. Agricultural Inspector
- 2) Upon inspection, NEETNY staff will report issues or verification of assigned checkpoints in their areas of responsibility to the Chief Inspector for inclusion in NEETNY's monthly report.
  - 3) Major construction materials testing and quality including concrete, reinforcement steel, culvert pipe and backfill will be the responsibility of the Quality Assurance Inspector.

A checklist has been developed to track conformance with the above considerations (Attachment 1). This checklist is part of NEETNY's standard for quality control during installation.

### **Materials QA**

Materials QA is divided into two key areas: (1) Shop Inspection/Shop QA Conformance, and (2) Field Receiving/Inspection.

- 1) Shop Inspection/Shop QA Conformance – NEETNY purchases major materials from thoroughly vetted vendors. Major components will have conformance reports from the vendor's QA program. NEETNY will have material vendors complete a qualification process which includes reviewing a vendor's QA program prior to approving them for procurement.
- 2) Steel Poles and Anchor Bolts - Because steel poles and anchor bolts are custom fabricated, they will be inspected in the shop for conformance using the vendor's QA Program previously approved by NEETNY's procurement division.
- 3) Major Components - Major Components such as conductor/wire and insulators will receive vendor shop QA verification via required conformance reports from the vendor. Test reports for conductor, OPGW and PHGW will also be provided by the vendor.
- 4) Material Availability - At least 14 days prior to construction, NEETNY shall file a report with the Secretary of the Commission confirming that all required construction materials are available. For purposes of this paragraph, an item of

construction material is available: (i) if it is located at a marshalling yard, (ii) if it is in a NEETNY warehouse or other routine NEETNY inventory stocking location, or (iii) if it is on order from a vendor with a scheduled delivery date prior to the time scheduled for its use in the Project.

- 5) Field Receiving/Inspection – All materials will be inspected and accounted for upon delivery at the Project Site before transfer of responsibility to the Construction Contractor. Transmission hardware/framing materials provided by the contractor will receive the same accountability inspection as NEETNY provided materials. Following receipt of poles and components at the storage yard, the assigned construction staff shall verify that the quantities of materials received are identical to those provided with the manufacturer’s fabrication drawings before transferring accountability to the Construction Contractor.

### **Reporting**

- 1) Field Review Reports - During construction, Field Review Reports will be completed weekly by the Construction Management Team for inspections of Design, Construction and Materials. The Field Review Reports will be compared to the quality documents from each vendor. NEETNY shall provide Department of Public Service (DPS) Staff, New York State Department of Environmental Conservation, and New York State Electric & Gas Corporation with weekly status reports transmitted by electronic mail summarizing construction and indicating construction activities and locations scheduled for the following 14 days.

Within 10 business days following completion of each Quality Control Audit, NEETNY will provide to DPS Staff, a report of such audit that includes: (i) a description of the audit results, particularly with respect to results identifying that one or more structures or components NEETNY purchased for the Project did not conform to the specification for structures or components described in the approved EM&CP; and (ii) any notes pertinent to the subject matter of such audit made at audit meetings by NEETNY personnel and/or contractors who performed the audit.

If any Quality Control Audits conducted by NEETNY identifies that one or more structures or components NEETNY purchased for installation in the Project do not

conform to the specification for structures and components described in the approved EM&CP, NEETNY shall: (i) provide written notification to the Secretary within not more than 72 hours of NEETNY's discovery of such non-conformity; and (ii) a description of the steps NEETNY will take to correct the non-conformity, including whether any components must be dismantled and returned to the manufacturer and a detailed estimate of construction costs and expected delays resulting from the non-conformity.

- 2) Nonconformance Field Report - If a Contractor installs materials, structures or components that do not conform to the specifications to those described in the EM&CP, NEETNY will, within 30 days after becoming aware of such incident, prepare and deliver to DPS Staff a summary report detailing the incident, the steps to be taken to rectify the mistake, the material and labor costs associated with rectifying the incident and the manner in which such costs will be accounted for separate from NEETNY's Project costs.
- 3) Shop Inspection Report – Upon award of the steel pole fabrication, NEETNY will supply the vendor's Quality Control documents to DPS Staff. The inspection plan will ensure conformance with the fabrication contract and the fabricator's approved Quality Control Plan at a prescribed frequency.

### **Steel Pole Structures & Anchor Bolts**

The vendor, following their Quality Control Plan will review each steel pole and associated anchor bolt cluster for the following:

- 1) Straightness
- 2) Welding
  - a. Performed in conformance with industry standards
  - b. Executed per approved vendor drawings
- 3) Dimensions of all steel pole elements conform to approved vendor drawings
- 4) Steel pole elements configured per the approved vendor drawings
- 5) Steel pole finish is per the contract documents
- 6) Anchor bolt clusters furnished per approved vendor anchor bolt drawings

To ensure the quality of materials used for steel pole structure fabrication and associated foundations, the vendor shall submit mill testing reports for the steel used to fabricate all elements of the steel pole structure and associated anchor bolt clusters. Lastly, the steel pole vendor shall be required to submit calculations and fabrication drawings bearing the seal of a Professional Engineer licensed in the State of New York.

### **Concrete**

The Construction Contractor will select the concrete supplier.

### **Reinforcing Steel**

The procurement of reinforcing steel shall be the responsibility of the Construction Contractor with the exception of anchor bolts which will be provided by NEETNY.

### **Conductor/Wire**

All conductor shall be in conformance with industry standards and good practice prior to shipment to the material storage yard. The vendor will provide the following minimum information to demonstrate compliance:

- 1) Upon request, formal documentation of conformance with all applicable American Society for Testing and Materials (ASTM) Standards and the vendor's manufacturing Quality Control Plan. Optical ground wire (OPGW) will also include end to end optical quality verification reports.
- 2) Formal documentation of conformance with all reel sizes and dimensions.

OPGW reels will receive an additional Construction QA field check by NEETNY before they are installed. Each reel will receive an end to end light continuity check prior to stringing. The same verification will be made as splicing progresses.

All stringing operations will be tested and installed in accordance with the latest revision of the applicable publications and standards of the following organizations:

- 1) National Electrical Safety Code (NESC)
- 2) American Society for Testing and Materials (ASTM)

- 3) Underwriters' Laboratories, Inc. (UL)
- 4) Insulated Power Cable Engineers Association (IPCEA)
- 5) National Electrical Manufacturers Association (NEMA)
- 6) Institute of Electrical and Electronics Engineers (IEEE)
- 7) American National Standards Institute (ANSI)
- 8) National Fire Protection Association (NFPA)
- 9) Environmental Protection Agency (EPA)
- 10) Local and State Electrical Codes
- 11) National Board of Fire Underwriters
- 12) National Electrical Code (NEC)

During stringing, the wires shall be handled to avoid kinking, birdcaging or scraping that could cause damage to the strands. At the end of each working day, the wire shall be safely secured. If it becomes necessary to leave the wire in the stringing blocks before sagging due to a sudden change in the weather or an equipment breakdown, the wire shall be left at a sag greater than that indicated in the sag chart for the highest temperature anticipated before sagging will occur. The wire shall be clear of the ground and safe for pedestrians or vehicle traffic passing by, especially on downhill spans and at guard structures.

The Construction Contractor shall limit the minimum bending radius of the optical ground wire in accordance with the manufacturer's recommendations.

The conductors shall typically be installed through the controlled tension method by means of single bull wheel-type tension stringing equipment, such that the reel supports are stationary and the conductors are pulled directly into the sheaves, with lead lines, without touching the ground or any other objects unless an alternate method is approved by NEETNY. The equipment and methods used for stringing the conductors shall be such that the conductors will not be damaged or persons injured.

The conductor shall be pulled from the top of the reels and threaded through the tensioner, entering and leaving on the top of the bullwheels, with the conductor entering on the left side and leaving on the right side of the bullwheels when facing the direction of the pull.

Maximum stringing tension for the optical ground wire will be provided by NEETNY with the sag and tension data.

The minimum wire sag during tension stringing shall at all times be a value greater than those specified in the sag tables. The conductor shall not be allowed to touch the ground, fences or other objects. Should the conductor contact the ground, other objects or become abraded during the stringing operation, it shall be lowered, wiped clean and closely inspected by the construction foreman.

The tension in the conductor being pulled from the reels to the tensioner shall be the minimum possible to prevent the wire from touching the ground or birdcaging.

The brakes for the tension stringing equipment shall be controlled by a manual mechanical device designed so that the desired tension will be held as long as the brakes are set. Hydraulic controlled devices will be acceptable if approved by NEETNY. The pulling tension shall not pre-stress the conductors. The maximum pulling tension shall not exceed 50% of the initial sagging tensions for each line conductor. The cable pullers, tensioners and pulling lines shall have an adequate margin of capability over this figure as approved by NEETNY. The pulling line and conductor shall be attached to a pulling board with a freely rotating ball bearing swivel. Particular care shall be taken at all times to prevent any loosening of strands and to ensure that the conductors do not become kinked, twisted or abraded in any manner.

A construction inspector shall be present at all long spans and road crossings during the pulling process to verify the conductor does not contact the ground. Should the conductor touch the ground during stringing and sagging operations, the operation should be stopped as to allow for provisions to assure that the conductor no longer touches the ground during stringing and sagging. Before being completely strung and sagged, the portion that has touched the ground should be inspected for burring, defacing or other damage. If damage has occurred, then it should be immediately repaired to the satisfaction of NEETNY. If the damage is minor, wire may be sanded down to prevent audible noise and signal interference.

If the conductors are damaged in any way, the Construction Contractor shall immediately repair or replace the damaged sections as directed by NEETNY. Slightly damaged or

abraded sections may be repaired by dressing with a fine emery cloth. NEETNY's Construction Supervisor shall make the determination of the level of damage to the conductor and the appropriate measures to be taken to repair the segment. Damage shall be defined as any deformity or foreign matter on the surface of the conductor that can be detected by sight or touch and cannot be completely removed without affecting the original geometry and surface condition of the wire. Damage includes, but is not limited to, nicks, scratches, abrasions, kinks, compressions, basketing, birdcaging, popped-out strands or broken strands.

### **Insulators**

All insulators procured for the ESL Project shall conform to NEETNY transmission standards and provided by pre-approved bidders.

Vendors shall be required to provide documentation upon request of batch conformance with ANSI 29.2 and the applicable version of ANSI 52 strength rating. This documentation would be provided to the Construction Superintendent prior to shipment of the materials to NEETNY's material storage yard.

### **Transmission Line Hardware/Framing Materials**

All materials, other than poles, wire and insulators, furnished in association with the Project shall be provided by the Construction Contractor based on an approved list by supplier provided by NEETNY. Inspections will occur upon receiving at NEETNY's Material Storage Yard for quantity and quality before being inventoried by the Construction Contractor.

## **Attachment 1**

### **Steel Pole Installation Checklist**

1A. Environmental Checklist

1B. Foundation Checklist

1C. Pole Installation Checklist

1D. Conductor Installation Checklist

## **1A. Environmental Checklist**

Structure Environmental Checklist

Structure Number	Verify compliance with all environmental; wildlife and SWPPP Requirements including dewatering practices	Verify environmental, wildlife and cultural avoidance areas are clearly demarcated within work areas.	Verify any oil and hazardous material is properly stored and labeled, fueling and repair is not in wetland areas and secondary containment is installed.	If necessary; verify mats or wide tracks are used to prevent ruts in wetlands.	Verify adequate drainage in right of way; and that the installation of any culverts is to specifications.	Verify right of way access points are identified and installed to specifications and maintained to avoid trackout.	Verify clearing is per specifications (ex: width of right of way; time of year restrictions)
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Structure Number	Verify compliance with all environmental; wildlife and SWPPP Requirements including dewatering practices	Verify environmental, wildlife and cultural avoidance areas are clearly demarcated within work areas.	Verify any oil and hazardous material is properly stored and labeled, fueling and repair is not in wetland areas and secondary containment is installed.	If necessary; verify mats or wide tracks are used to prevent ruts in wetlands.	Verify adequate drainage in right of way; and that the installation of any culverts is to specifications.	Verify right of way access points are identified and installed to specifications and maintained to avoid trackout.	Verify clearing is per specifications (ex: width of right of way; time of year restrictions)
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EAST STOLLE TAKE-OFF							

## **1B. Foundation Checklist**







## **1C. Pole Installation Checklist**





































## **1D. Conductor Installation Checklist**



























