



**DESIGN & CONSTRUCTION GROUP  
THE GOVERNOR NELSON A. ROCKEFELLER  
EMPIRE STATE PLAZA  
ALBANY, NY 12242**

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**ADDENDUM NO. 2 TO PROJECT NO. 47247**

**ELECTRICAL WORK  
REPLACE ELECTRICAL EQUIPMENT,  
BUILDINGS 819 AND 842  
ROCKLAND PC, HUDSON RIVER CAMPUS  
10 ROSS CIRCLE  
POUGHKEEPSIE, NY**

April 24, 2024

**NOTE:** This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

**SPECIFICATION GROUP**

1. SECTION 260513.12 PRIMARY WIRING - 15KV NOMINAL – EPR INSULATED – ALUMINUM: Add the accompanying Section (pages 260513.12 – 1 thru 260513.12 – 8) to the Project Manual.

**END OF ADDENDUM**

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Design & Construction

## SECTION 260513.12

### PRIMARY WIRING - 15KV NOMINAL – EPR INSULATED – ALUMINUM

#### PART 1 GENERAL

##### 1.01 REFERENCE STANDARDS

- A. ICEA S-93-639/NEMA WC-74, 5-46KV Shielded Power Cables for Use in the Transmission and Distribution of Electric Energy.
- B. ANSI/ICEA S-97-682 Standard for Utility Shielded Power Cables Rated 5 through 46 kV.
- C. AEIC CS8-07 Specification for Extruded Dielectric, Shielded Power Cables Rated 5 through 46 kV.
- D. UL 1072 Medium-Voltage Power Cables.
- E. IEEE 1202 Standard for Flame Testing of Cables for Use in Cable Tray in Industrial and Commercial Occupancies.
- F. IEEE 48 Standard Test Procedures and Requirements for Alternating-Current Cable Terminations.
- G. IEEE 404-2012 - Standard for Extruded and Laminated Dielectric Shielded Cable Joints.
- H. IEEE 386-2006 - Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.

##### 1.02 SUBMITTALS

- A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.
- B. Submittals Package: Submit the data specified below for preliminary approval all at the same time as a package. After preliminary approval, submit the data and samples specified below for final approval all at the same time as a package.
  - 1. Assemble submittal package in chronological order as indicated in the specifications sections and subsections; e.g., (260513-1.02C through 260513-2.06 ACCESSORIES
  - 2. No cable shall be installed until final approval. Any cable installed without final approval will be at the contractors own risk.
- C. Submit the following for preliminary approval:
  - 1. Indicate Specification Section and Subsection at the top of each Catalog Sheet, Specifications, and Installation Instructions.

2. Complete manufacturer's construction details and specifications for the cables, including physical and electrical characteristics of insulation, shields and jackets.
  3. Overall dimension and ampacity of cable.
  4. Manufacturers' published product data sheets that indicate compliance with the aforementioned Reference Standards.
  5. Splicing and termination data, including the following:
    - a. Bill of Materials.
      - 1) Indicate specification section and subsection next to each item listed on the Bill of Materials; e.g., (260513-1.02, C, 4, f Drawings of splicings).
    - b. Method of connecting conductors.
    - c. Details of cable preparation.
    - d. Method of applying materials (including quantities and recommended tools).
    - e. Precautionary measures.
    - f. Drawings showing method of splicing, complete with dimensions.
    - g. Written statement from cable manufacturer that the specific splices and terminations submitted are acceptable.
    - h. Written statement from splice/termination manufacturer that the specific splices and terminations submitted are suitable for the proposed application.
  6. Furnish cable manufacturer's certified copies of the AEIC qualification test for the cable being proposed.
- D. Final Approval: After preliminary approval, submit the following for final approval:
1. Cable manufacturer's certified test data from tests performed on the completed cable.
  2. Samples of splicing and termination materials if requested (complete kits will be returned and, if approved, may be used in the Work). Include:
    - a. Full roll of all tapes in original box or container, with the date of manufacture indicated thereon.
    - b. Other materials in sufficient quantity to construct a complete splice and labeled for identification.
    - c. Entire factory packaged kit if splice or termination is of the kit type.
  3. Written statement from cable manufacturer indicating recommended pulling compounds.
  4. Resume of each cable splicer's experience. Include:
    - a. Details of type of high voltage splicing and terminations performed.
    - b. Types of cables which were spliced.
    - c. Job locations.
    - d. Number of years performing splices and terminations. Minimum 5 years required.
    - e. Certificate of training from the splice/termination manufacturer.
    - f. National Cable Splicing Certification Board certification. The cable splicer/terminator must have a certification from the National Cable Splicing Certification Board (NCSCB) in the

field of splicing and terminating shielded medium voltage (5 kV to 35 kV) power cable using pre-manufactured kits (pre-molded, heat-shrink, cold shrink).

5. Catalog sheets, specifications and installation instructions for all products.
  6. Company Field Advisor Data:
    - a. Name, business address and telephone number of Company Field Advisor secured for the required services.
    - b. Certified statement from the Company, listing the qualifications of the Company Field Advisor.
    - c. Services and each product for which authorization is given by the Company, listed specifically for this project.
- E. Contract Closeout Submittals:
1. Test Report: (Test Record-Power Cable Proof Test) form (BDC-362).
  2. Certificates:
    - a. Affidavit, signed by the cable manufacturer's Company Field Advisor and notarized, certifying that the cable has been installed in accordance with the manufacturer's recommendations and is operating properly.
    - b. Affidavit, signed by the splice and termination manufacturer's Company Field Advisor and notarized, certifying that the splices and terminations were constructed in accordance with the manufacturer's recommendations and are operating properly.

### **1.03 QUALITY ASSURANCE**

- A. If brand names other than those specified are proposed for use, furnish the AEIC core and thermo-mechanical qualification test reports. Include a list of 5 Completed Installations indicating name of facility contact person with phone number, voltage, size and length of EPR cable installed.
- B. Company Field Advisor: Secure the services of the cable manufacturer's Company Field Advisor for a minimum of 16 working hours for the following:
  1. Render advice regarding method of installing cable.
  2. Inspection of equipment for installing cable.
  3. Witness 30 percent of cable pulling.
  4. Witness construction of at least one splice and one termination by each cable splicer who will be doing the actual cable splicing.
    - a. If the splices or terminations are other than the cable manufacturer's, secure the services of the splice and termination manufacturer's Company Field Advisor to concurrently witness construction of the splices and terminations and also certify with an affidavit that the splices and terminations were constructed in accordance with the splice and termination manufacturer's recommendations.
  5. Witness high voltage after installation test.
  6. Certify with an affidavit that the aforementioned particulars are satisfactory and the cable is installed in accordance with cable manufacturer's recommendations.

- C. Testing Company: Secure the services of a qualified International Electrical Testing Association (NETA) accredited independent testing company to perform specified field quality assurance testing, for a high voltage after installation test: Test Record-Power Cable Proof Test form BDC-362).

#### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. Cable Delivery:
  - 1. No insulated cable over one year old when delivered to the site will be acceptable.
  - 2. Keep ends of cables sealed at all times, except when making splices or terminations. Use heat shrinkable plastic end caps with sealant as produced by Raychem Corp., or Thomas & Betts Corp. (Elastimold), or other methods approved by cable manufacturer.
  - 3. Include the following data durably marked on each reel:
    - a. Facility name and address.
    - b. Contractor's name.
    - c. Project title and number.
    - d. Date of manufacture.
    - e. Cable size and voltage rating.
    - f. Manufacturer's name.
    - g. Linear feet of cable.
    - h. Location where cable is to be installed (Example: Between manholes Nos. \_\_\_\_\_ and \_\_\_\_\_).
- B. Cable Storage: Store where cable will be at optimum workability temperature recommended by cable manufacturer.

#### **1.05 MAINTENANCE**

- A. Special Tools: Furnish one set of special tools for the assembly of premolded splices (if used). Store them at the Site where directed.

### **PART 2 PRODUCTS**

#### **2.01 CABLES**

- A. Scope: 15 kV, 133% insulation level, single conductor cable, UL listed Type MV-105 for general applications installed indoors or outdoors in duct, conduit, tray, aerially and direct burial. Cable shall be manufactured and tested in accordance with the ICEA, AEIC, and UL standards listed in Section 1.01 of this specification.
- B. Conductors: The conductor shall be 8000 series aluminum, Class B, compact stranding in accordance with ASTM B800 and ASTM B836. The insulation shall be free-stripping from the conductor.
- C. Conductor Shield: Extruded semi-conducting thermosetting compound with thickness and properties in accordance with ICEA S-97-682.

- D. Insulation: Ethylene Propylene rubber (EPR), 105C, colored to contrast with the shield layers. The nominal insulation thickness shall be 220 mils. Physical and electrical properties of the insulation shall be in accordance with ICEA S-97-682 for Class III insulation.
- E. Insulation Shield: Extruded thermoset semi-conducting polymeric layer, free stripping from the insulation. It shall be in intimate contact with the outer surface of the insulation and shall be free-stripping, leaving no conducting particles or other residue on the insulation surface. The layer shall be legibly identified as being semi-conducting. The thickness and properties of the layer shall be in accordance with ICEA S-97-682.
- F. Metallic Shield: 5 mil annealed copper tape shield with a nominal 25% overlap. The tape shall meet the requirements of ICEA S-97-682.
- G. Jacket: Polyvinyl Chloride (PVC), Thermoset Chlorinated Polyethylene (CPE), or Thermoplastic CPE overlaying jacket with physical properties and thicknesses in accordance with the requirements of UL 1072 and ICEA S-93-639,
- H. Cable shall be UL listed Type MV-105, marked "SUN RES FOR CT USE"
- I. Approved Manufacturers: Southwire Spec 46311, or approved equal from Prysmian Power Cables and Systems, or Okonite.

## 2.02 TERMINATIONS

- A. Materials: All materials required for a complete termination shall be an engineered kit from one manufacturer, designed specifically for the type of cable and conductor to be terminated.
- B. Ampere Rating: Not less than ampere rating of cable.
- C. Voltage Rating: Not less than voltage rating of cable.
- D. Manufacturer: Furnish terminations by one of the manufacturers listed below, if acceptable to the cable manufacturer.
  - 1. IEEE 48 Class 1 outdoor Terminations:
    - a. Elastimold's series PCT1-1X, 16THG, or 35MTG; 3M Cold-Shrink QT-III Terminations; or Raychem Corp.'s Heat-Shrinkable HVT-Z-T5. Provide all sealing and grounding materials as recommended by the manufacturer. Equip terminations with or without skirts as recommended by manufacturer.
  - 2. IEEE 48 Class 3 indoor Terminations:
    - a. Elastimold's series PCT1-1X, 35MSC or 35MTGI; or Raychem Corp.'s Heat-Shrinkable HVT-Z-T5. Provide all grounding materials as recommended by the manufacturer. Equip terminations with or without skirts as recommended by manufacturer.

### **2.03 SPLICES**

- A. Materials: All materials required for a complete splice shall be an engineered kit from one manufacturer, designed specifically for the type of cable and conductor to be spliced.
- B. Ampere Rating: Not less than ampere rating of cable.
- C. Voltage Rating: Not less than voltage rating of cable.
- D. Splices Installed in Vaults, Manholes (any wet locations): Waterproof and submersible.
- E. Manufacturer: Furnish splices by one of the manufacturer's listed below, if acceptable to the cable manufacturer. Provide all sealing and grounding materials.
  - 1. Elastimold's series PCJ; G&W Electric Co.'s Universal Splicing System; 3M's Cold Shrink Splice Kits; or Raychem Corp.'s Heat-Shrinkable HVS.

### **2.04 DEAD FRONT EQUIPMENT CONNECTIONS**

- A. 200A Loadbreak: Elastimold's series 165LR or 166LR; Cooper Power LE215. All with test points when required.
- B. 200A Dead break: Elastimold's series 156LR; Cooper Power DE225. All with test points when required.
- C. 600A Dead break: Elastimold's series K655LR, Raychem Corp's ELB-15 series, or Cooper Power BOL-T class. All with test Point when required.

### **2.05 CABLE DEAD ENDS (FULL VOLTAGE)**

- A. For Solid Dielectric Cable:
  - 1. Elastimold's Premolded Splice with Dead-End Plug, or Raychem Corp.'s Live End Seals HVES.

### **2.06 ACCESSORIES**

- A. Pulling Compounds: As recommended by cable manufacturer.
  - 1. Polywater "A", "G", "J" or "WJ" lubricants, Plymouth/Bishop No. 45 Cable Pulling Lubricant, Aqua-Gel II (Ideal Industries, Inc.) or Aqua-Gel CW (Ideal Industries, Inc.).
- B. Arc Proofing Tapes:
  - 1. Arc Proofing Tape: Mac Products Inc's AP30-30 or AP, 3M's 77, Plymouth Rubber Co.'s Plymouth Bishop 53 Plyarc, or Quelcor Inc.'s Quelpyre.
  - 2. Glass Cloth Tape: Mac Products Inc.'s TAPGLA 5066, 3M's 69, or Plymouth Rubber Co.'s Plymouth Bishop 77 Plyglas.
  - 3. Glass-Fiber Cord: Mac Products Inc.'s MAC 0527, or Quelcor Inc.'s QTC-250.

- C. Tags: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inches high.
  - 1. Phenolic: Two color laminated engraver's stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
  - 2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Cables:
  - 1. Install cables in conduit after conduit system is completed.
  - 2. Keep ends of cables sealed watertight at all times, except when making splices or terminations.
  - 3. No grease, oil, lubricant other than approved pulling compound may be used to facilitate the pulling-in of cables.
  - 4. Use pulling eye attached to conductor(s) for pulling-in cables. Cable grip will not be allowed. Seal pulling eye attachment watertight.
  - 5. Pull all cables with a dynamometer or strain gage incorporated into the pulling equipment. Do not pull cables unless the Director's Representative is present to observe readings on the dynamometer or strain gage during the time of actual pulling.
- B. Terminations and Splices:
  - 1. General: Splice and terminate cable in accordance with manufacturer's approved installation instructions, employing specific tools recommended by the manufacturer.
  - 2. Use IEEE 48 Class 1 terminations to terminate cable in wet locations.
  - 3. Use IEEE 48 Class 1 terminations to terminate cable inside of outdoor equipment which is not equipped with space heaters (pad mounted switches, pad mounted transformers, etc). Class 1 or Class 3 terminations may be used to terminate cable inside of outdoor switchgear cubicles which are equipped with space heaters (metal-clad switchgear, metal-enclosed interrupter switchgear, etc.).
  - 4. Use IEEE 48 Class 1 or Class 3 Terminations to terminate cable in dry locations.
  - 5. Ground shield at splices and terminations.
  - 6. Incorporate approved method to prevent moisture from entering splices through grounding conductor.
- C. Arc Proofing: Arc proof feeders installed in a common pullbox or manhole as follows:
  - 1. Arc proof new feeders.
  - 2. Arc proof existing feeders that are spliced to new feeders.
  - 3. Arc proof each feeder as a unit with half-lapped layer of 55 mils thick arc proofing tape, random wrapped or laced with glass cloth tape or glass-fiber cord. For arc proofing tape less than 55 mils thick add layers to equivalent of 55 mils thick arc proofing tape.



- D. Identification of Feeders: Identify feeders in manholes, pullboxes and in equipment to which they connect:
  - 1. Install tags on each insulated conductor indicating phase leg. Attach tags with non-ferrous metal wire. Install phase leg tags under arc proofing tapes.
  - 2. Install tags on each feeder indicating feeder number, date installed (month, year), type of cable, voltage rating, size, and manufacturer. Attach tags to feeders with non-ferrous metal wire or brass chain. Install tags so that they are easily read without moving adjacent feeders or require removal of arc proofing tapes.
- E. Phase Relationship: Connect feeders to maintain phase relationship through system. Phase legs of feeders shall match bus arrangements in equipment to which the feeders are connected.

### **3.02 FIELD QUALITY CONTROL**

- A. High Voltage After Installation Test: (Test Record-Power Cable Proof Test ) form (BDC-362).
  - 1. Have the cable installation tested by the testing company.
  - 2. Perform test on feeders comprised of new cable after cable has been installed complete with all splicing, bonding, etc., and prior to placing cable into service. For feeders comprised of new and existing cable, perform test on new cable after it has been installed complete with splicing, bonding, etc., but prior to splicing to existing cable. Do not splice new cable to existing cable until new cable test has been completed. Do not perform test on existing cable.
  - 3. Perform test with potential and duration specified by the State after approval of manufacturer's certified test data. Follow test procedure summarized on Test Record-Power Cable Proof Test form BDC-362 and applicable test methods in ICEA and AEIC Specifications. Do not make tests until test voltages and duration have been specified in writing by the State.
  - 4. List results of the tests on form BDC-362 supplied by the Director's Representative.
  - 5. Perform test in the presence of the Director's Representative and the Company Field Advisor.
  - 6. All separable connector interfaces must be plugged with appropriate mating product during proof testing. Consult with manufacturer's field representative for instruction.

### **3.03 CABLE SCHEDULE**

- A. Use the following for primary wiring:
  - 1. Cable as outlined in Section 2.01 of this specification.