

**PART 1- GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. This Section includes cables and related splices, terminations, and accessories for medium-voltage electrical distribution systems.

**1.03 DEFINITIONS**

- A. NETA ATS: Acceptance Testing Specification.

**1.04 SUBMITTALS**

- A. Product Data: For each type of cable indicated. Include splices and terminations for cables and cable accessories.
- B. Samples: 16-inch (400-mm) lengths of each type of cable indicated.
- C. Qualification Data: For Installer.
- D. Material Certificates: For each cable and accessory type, signed by manufacturers.
- E. Source quality-control test reports.
- F. Field quality-control test reports.

**1.05 QUALITY ASSURANCE**

- A. Installer: Engage a cable splicer, trained and certified by splice material manufacturer, to install, splice, and terminate medium-voltage cable.
- B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
  - 1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.
- C. Source Limitations: Obtain cables and accessories through one source from a single manufacturer.

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- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- E. Comply with IEEE C2 and NFPA 70.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with O&R utility requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Cables:
    - a. Kerite Company.
    - b. Hubbell Incorporated.
    - c. The Okonite Company.
  - 2. Cable Splicing and Terminating Products and Accessories:
    - a. Thomas & Betts Corporation.
    - b. Thomas & Betts Corporation/Elastimold.
    - c. 3M; Electrical Products Division.

**2.02 CABLES**

- A. Cable Type: MV90.
- B. Comply with UL 1072, AEIC CS 8.
- C. Conductor: Aluminum.
- D. Conductor Stranding: Concentric lay, Class B.
- E. Strand Filling: Conductor interstices are filled with impermeable compound.
- F. Conductor Insulation: Crosslinked polyethylene.
- G. Conductor Insulation: Ethylene-propylene rubber.
  - 1. Voltage Rating: 15 kV.
  - 2. Insulation Thickness: 175 MILS.
- H. Shielding and Jacket: Corrugated copper drain wires embedded in extruded, chlorinated, polyethylene jacket.
- I. Cable Jacket: Sunlight-resistant PVC.

**2.03 SPLICE KITS**

- A. Connectors and Splice Kits: Comply with IEEE 404; type as recommended by cable or splicing kit manufacturer for the application.
- B. Splicing Products: As recommended, in writing, by splicing kit manufacturer for specific sizes, ratings, and configurations of cable conductors. Include all components required for complete splice, with detailed instructions.
  - 1. Combination tape and cold-shrink-rubber sleeve kit with re-jacketing by cast-epoxy-resin encasement or other waterproof, abrasion-resistant material.
  - 2. Heat-shrink splicing kit of uniform, cross-section, polymeric construction with outer heat-shrink jacket.
  - 3. Premolded, cold-shrink-rubber, in-line splicing kit.
  - 4. Premolded EPDM splicing body kit with cable joint sealed by interference fit of mating parts and cable.

**2.04 SEPARABLE INSULATED CONNECTORS**

- A. Description: Modular system, complying with IEEE 386, with disconnecting, single-pole, cable terminators and with matching, stationary, plug-in, dead-front terminals designed for cable voltage and for sealing against moisture.
- B. Terminations at Distribution Points: Modular type, consisting of terminators installed on cables and modular, dead-front, terminal junctions for interconnecting cables.
- C. Load-Break Cable Terminators: Elbow-type units with 200-A load make/break and continuous-current rating; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include test point on terminator body that is capacitance coupled.
- D. Dead-Front Terminal Junctions: Modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated, watertight conductor connection between terminals and complete with grounding lug, manufacturer's standard accessory stands, stainless-steel mounting brackets, and attaching hardware.
  - 1. Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire.
  - 2. Portable Feed-Through Accessory: Two-terminal, dead-front junction arranged for removable mounting on accessory stand of stationary terminal junction.
  - 3. Grounding Kit: Jumpered elbows, portable feed-through accessory units, protective caps, test rods suitable for concurrently grounding three phases of feeders, and carrying case.
  - 4. Standoff Insulator: Portable, single dead-front terminal for removable mounting on accessory stand of stationary terminal junction. Insulators suitable for fully insulated isolation of energized cable-elbow terminator.
- E. Test-Point Fault Indicators: Applicable current-trip ratings and arranged for installation in test points of load-break separable connectors, and complete with self-resetting indicators capable of being installed with shotgun hot stick and tested with test tool.
- F. Tool Set: Shotgun hot stick with energized terminal indicator, fault-indicator test tool, and carrying case.

**2.05 ARC-PROOFING MATERIALS**

- A. Tape for First Course on Metal Objects: 10-mil- (250-micrometer-) thick, corrosion-protective, moisture-resistant, PVC pipe-wrapping tape.
- B. Arc-Proofing Tape: Fireproof tape, flexible, conformable, intumescent to 0.3 inch (8 mm) thick, compatible with cable jacket.
- C. Glass-Cloth Tape: Pressure-sensitive adhesive type, 1/2 inch (13 mm) wide.

**2.06 SOURCE QUALITY CONTROL**

- A. Test and inspect cables according to ICEA S-97-682 before shipping.
- B. Test strand-filled cables for water-penetration resistance according to ICEA T-31-610, using a test pressure of 5 psig (35 kPa).

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- A. Install cables according to IEEE 576.
- B. Pull Conductors: Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
  - 1. Where necessary, use manufacturer-approved pulling compound or lubricant that will not deteriorate conductor or insulation.
  - 2. Use pulling means, including fish tape, cable, rope, and basket-weave cable grips that will not damage cables and raceways. Do not use rope hitches for pulling attachment to cable.
- C. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- D. Support cables according to Division 26 Section "Common Work Results for Electrical."
- E. Install direct-buried cables on leveled and tamped bed of 3-inch- (75-mm-) thick, clean sand. Separate cables crossing other cables or piping by a minimum of 4 inches (100 mm) of tamped earth. Install permanent markers at ends of cable runs, changes in direction, and buried splices.
- F. Install "buried-cable" warning tape 12 inches (305 mm) above cables and conduit.
- G. In manholes, handholes, pull boxes, junction boxes, and cable vaults, train cables around walls by the longest route from entry to exit and support cables at intervals adequate to prevent sag.
- H. Install cable splices at pull points and elsewhere as indicated; use standard kits.
- I. Install terminations at ends of conductors and seal multiconductor cable ends with standard kits.

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- J. Install separable insulated-connector components as follows:
1. Protective Cap: At each terminal junction, with one on each terminal to which no feeder is indicated to be connected.
  2. Portable Feed-Through Accessory: Three.
  3. Standoff Insulator: Three.
- K. Arc Proofing: Unless otherwise indicated, arc proof medium-voltage cable at locations not protected by conduit, cable tray, direct burial, or termination materials. In addition to arc-proofing tape manufacturer's written instructions, apply arc proofing as follows:
1. Clean cable sheath.
  2. Wrap metallic cable components with 10-mil (250-micrometer) pipe-wrapping tape.
  3. Smooth surface contours with electrical insulation putty.
  4. Apply arc-proofing tape in one half-lapped layer with coated side toward cable.
  5. Band arc-proofing tape with 1-inch- (25-mm-) wide bands of half-lapped, adhesive, glass-cloth tape 2 inches (50 mm) o.c.
- L. Seal around cables passing through fire-rated elements according to Division 07 Section "Penetration Firestopping."
- M. Install fault indicators on each phase where indicated.
- N. Ground shields of shielded cable at terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated-connector fittings, and hardware.
- O. Identify cables according to Division 26 Section "Identification for Electrical Systems."

**3.02 FIELD QUALITY CONTROL**

- A. Testing: Installer will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:
- C. Perform the following field tests and inspections and prepare test reports:
1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.
  2. After installing medium-voltage cables and before electrical circuitry has been energized, test for compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

**\*\*END OF SECTION\*\***