

SPECIFICATION NO. 1
1/0 ALUMINUM 15 KV TR/XLP UNDERGROUND CABLE
REVISED 11/06/07

1.0 GENERAL

- 1.1 SCOPE. This specification describes the requirements for 15KV class TR/XLP underground cable suitable for conduit installation or direct burial in wet or dry locations on the 12,470 volt grounded-wye distribution system of SMECO. Where specific Standards publications are referred to, the latest revision thereof shall apply.

2.0 BASIC SPECIFICATIONS

The cable shall meet the requirements of the cable order, this specification and the most recent revisions of AEIC CS8-07 and ANSI/ICEA S-94-649-2004. If there is a conflict between publications, their order of priority will be as listed in the previous sentence. The cable shall have a line-to-line voltage rating of 14,400 volts and a BIL rating of 110KV. The cable shall have a rated ampacity of at least 215 amps at 90 degree C in a direct buried, three phase application, with an ambient earth temperature of 20 degree C and a 100% loading factor. A copy of each manufacturer's AEIC Qualification report shall be submitted to SMECO.

3.0 CONSTRUCTION

The cable shall consist of the following components: A central conductor, an extruded conductor shield, insulation (TR/XLP), an extruded insulation shield, a helically wound concentric neutral, and a non-conductive encapsulating PE jacket. The conductor shield, insulation, and insulation shield shall be applied to the conductor via a one-pass, true triple-extrusion dry curing process, and shall be vulcanized together. The diameter of the cable over the insulation shall be .850" $\pm$ 0.045". The diameter of the cable over the insulation shield shall be .930" $\pm$ 0.065". All dimensions shall be per AEIC CS8-07. **(For SMECO reference information only: For 175 mil cable, the diameter of the cable over the insulation was .77" $\pm$.03". The diameter of the cable over the insulation shield was .85" $\pm$.05".)**

4.0. DETAILS COMPONENT SPECIFICATIONS

- 4.1 CENTRAL CONDUCTOR. The central conductor shall be 1/0 AWG, and consist of 19 compressed strands of commercial 1350 Class B aluminum wire per ASTM designations B-230, B-231 and B-233.
- 4.2 CONDUCTOR FILLER. The interstices between the strands of the central conductor shall be filled with a conductive material designed to prevent the longitudinal migration of water. This material shall be



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completely comparable with the conductor and the conductor shield materials. Also meets ICEA T-31-610.

- 4.3 CONDUCTOR SHIELD. The conductor shield shall be black semi-conducting thermoset material compatible with the strand fill material and overlying insulation. It shall fill the outer strands without penetrating the stranded conductor and will fit the conductor tightly, but strip readily. (Complies with AEIC CS8-07.)
- 4.4 INSULATION. The insulation shall be natural tree-retardant, cross-linked polyethylene, Union Carbide 4202 or equivalent, with a minimum thickness of 0.210" (133% insulation for 15KV class cables per AEIC CS8-07). Void and contaminant levels shall comply with AEIC CS8-07.
- 4.5. INSULATION SHIELD. The insulation shield shall be black semi-conducting thermosetting, polymeric layer meeting the requirements of ANSI/ICEA S-94-649-2004. It shall be tightly extruded over the insulation to serve as an electrostatic shield and protective covering. It shall be suitable for exposure to sunlight and other anticipated atmospheric conditions at temperatures specified in the referenced standards and should be applied such that all conducting material can be removed easily without the application of heat. The stripping tension values and the thickness of the extruded insulation shall be in compliance with AEIC CS8-07.
- 4.6. CONCENTRIC NEUTRAL FULL. The concentric neutral shall consist of 16 solid bare (uncoated) #14 AWG annealed round copper wires helically wound around the cable, and shall conform to ANSI/ICEA S-94-649-2004.
- 4.7 CABLE JACKET. An nonconducting outer jacket shall be applied directly over the concentric neutral conductor filling the interstices area (encapsulating but allowing the neutral wire to maintain equal space and intimate contact with the underlying extruded insulation shield). The jacket shall be made of extruded black, linear low density polyethylene (LLDPE) compound meeting the requirements of ANSI/ICEA S-94-649-2004. The minimum thickness of the jacket over the metallic neutral wires shall comply with ANSI/ICEA S-94-649-2004.

5. TESTING

All testing and test data for each production length of Cable shall be performed in compliance with AEIC CS8-07. One (1) certified copy of the test report shall be required for each order of cable as described in AEIC CS8-07. This report is to be provided within two (2) weeks of the completion of testing, and shall include verification of all shipping lengths having passed the apparent discharge test described in the appropriate publications mentioned above.



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6.0. CABLE IDENTIFICATION

- 6.1 The overall jacket shall be marked with three (3) extruded red stripes of 1/4" minimum width and oriented at 120 degree intervals. It should also be marked throughout its length with the manufacturer's identification, type and thickness of insulation, type and size of the conductor, rated voltage, year of production and the sequential foot markings a maximum of every three feet. Polymeric insulation shielding shall be conspicuously identified as semiconducting. Durable markings on the outer jacket only may be accomplished by indent printing. (but not to a depth greater than 15% of its thickness) Indent printing is to be accomplished by hot stamp foot marking.
- 6.2 The manufacturer shall maintain reel records of each reel length of cable for a period not less than a year from the manufacturing date.
- 6.3 In addition to the identification requirements of the AEIC specification, the legend shall include the buried cable identifier symbol, lightning bolt, as detailed in section 350 of the National Electrical Safety Code.

7.0. STANDARD PACKAGING AND SHIPPING

The cable shall be furnished in continuous lengths of at least 2000 feet on non-returnable wooden reels. The packing and shipping of each reel shall comply with the NEMA WC26. The reels shall be shipped in an upright position. A durable label shall be securely attached to each flange of each reel indicating the P.O., manufacturer, description of cable, reel #, total quantity on reel, tare and gross weight of reel, first and last sequential foot markings. The internal end of the cable shall be brought through a cable slot of the flange and securely stapled to the outside. The reel dimensions should be within these parameters: Maximum diameter of flange 50", Maximum overall width ranging from 32-37" and drum diameter ranging from 21-24". (SMECO prefers NEMA STD. 50" x 32" x 24") Also, no wrapping over the cable is preferred.

Note: Minimum Arbor Hole 3".