

Scope of Work

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I. SCOPE OF SOLICITATION

Clemson University is seeking equipment for a medium voltage cable for use on campus' primary distribution system. Please see Section III below for the detailed specifications.

This will be awarded to one Offeror based on bids. Please note all items must be delivered on or before April 30, 2014.

II. INSTRUCTIONS TO OFFERORS

Regardless of specific requirements below or in this document, Offerors are required to submit their proposal electronically through the Clemson University online bidding system. To do so you must login (registering first) at <https://sciquest.ionwave.net/prod/default.aspx?company=clemson>, and follow specific instructions for this solicitation. You should register several days in advance of the bid closing date so you can be approved and login in time to submit a response.

Be sure to see the Event Activities in the online bidding system for details on deadlines for questions.

III. SCOPE OF WORK / SPECIFICATIONS

PART 1 - GENERAL:

The following specifications detail medium voltage cable for use on the 4,160V and 12,470V campus primary distribution system. The cable will be installed in concrete encased duct bank or utility tunnels. The following specification covers the construction requirements of the cable to be furnished.

PART 2 - PRODUCTS & STANDARDS: INDUSTRY STANDARDS

The cable shall be manufactured and tested in accordance with the latest editions of the following industry standards as applicable:

- ASTM: B-8 Concentric Lay Stranded Copper Conductor Tinned Soft or Annealed Copper Wire.
- AEIC: Association of Edison Illuminating Companies (AEIC CS6).
- ICEA: Insulated Cable Engineers Associations (ICEA S-68-516) EPR Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
- IEEE: Institute of Electrical and Electronic Engineers, Inc.
- NEC: National Electrical Code
- UL: Underwriters Laboratories, Inc. UL-1072, "Standard for Medium-Voltage Power Cables"

APPLICATION

The cables described and specified herein shall be suitable for use in wet and dry locations, underground duct systems, and aerial installations under approved installation practice as recommended by the cable manufacturer and the NEC. All cables shall be rated 105 deg. C for normal operation, 140 deg. C for emergency overload operation, and 250 deg. C for short-circuit condition.

All cables specified shall comply with the following standards as applicable per the National Electrical Code:

- Ampacities Article 310, Article 318-13
- Wiring Methods Article 300 & 710
- Cable Trays Article 318
- Bending Radius Article 300-34, Article 334-11
- Cable Type MV-105 Article 326

IDENTIFICATION

Each conductor and/or outer jacket shall be painted with the following legend at a maximum of two-foot intervals:

- Manufacturer's Name
- Conductor Size-AWG, kCMil and Type (CU)
- Voltage
- Identification of Insulation
- Year of Manufacture
- UL Cable Type – (MV-105)

SINGLE CONDUCTOR CONSTRUCTION REQUIREMENTS

Cables shall be UL Listed as Type MV-105 for use in accordance with the National Electric Code.

CONDUCTORS

Conductors shall be Class B concentric compressed stranded bare soft copper per ASTM B-8 or compact stranded bare copper per ASTM B-496.

EXTRUDED STRAND SCREEN

Each conductor shall be covered with an extruded, thermosetting, semi-conducting screen, uniformly applied over the surface of the conductor meeting the requirements of ICEA S-68-516 and UL 1072.

INSULATION

The insulation over the strand screen of each conductor shall be ethylene-propylene rubber (EPR). Cables shall be insulated to 15 kV, 133% insulation level. Minimum average insulation thickness shall be 220 mils per the requirements of ICEA S-68-516, UL 1072 and AEIC CS-6.

INSULATION SHIELDING

Each conductor shall have an extruded thermosetting, semi-conducting insulation screen applied over the insulation meeting the requirements of ICEA S-68-516, UL 1072 and AEIC CS-6.

METALLIC TAPE SHIELD

Each conductor shall have a bare or tinned 0.005 inch thick minimum copper shielding tape helically applied over the extruded insulation shield with a nominal overlap of 12-1/2% of the tape width.

CORONA TEST

All corona tests shall be performed by the cable manufacturer within their manufacturing facilities and in accordance with the procedures of section F of AEIC CS-6. Cable must pass standard AEIC Corona Test.

JACKET FOR SINGLE CONDUCTOR CABLES

The overall jacket shall be flame-retardant PVC or CPE. The minimum average thickness shall be 80 mils.

PART 3 – TESTING AND TECHNICAL DATA

TESTING OF FINISHED CABLE

Final testing of the finished cable shall be in accordance with the latest edition of ICEA S-68-516, UL 1072 and shall include the electrical and partial discharge tests of AEIC CS-6, latest edition.

WARRANTY

The cable manufacturer shall explicitly warrant each reel of cable to be free from defects in material, design and workmanship to provide reliable performance for a 25 year life. The warranty assumes the cable is installed, spliced, terminated and maintained in accordance with the manufacturer's recommendations. When the manufacturer and the Owner mutually determine a portion or all of the cable is defective, the supplier shall furnish a replacement for the defective cable. The replacement cable shall comply with this specification and be delivered to the original delivery point free of any charge to the Owner or the State of South Carolina. Each bidder shall submit written warranty with corporate seal and signature as a part of the cable submittal/bid package.

MANUFACTURER

The cable supplied shall be Okoguard-Okoseal by The Okonite Company or approved equal. Requests for alternate manufacturers shall be submitted to the Engineer with the following specific information. The Engineer shall obtain written approval from the Owner prior to the approval of any substitution:

- Name of Manufacturer
- Minimum Bending Radius
- Complete description with dimensions, weights and overall diameters for the conductor and outer jacket
- Location of Manufacturing Facility where cable will be produced
- Written warranty per previous specification

IV. BIDDING SCHEDULE

The required items are listed below. Please note, pricing will be entered into the online bidding system separately as shown. Pricing must be all inclusive.

ITEM 1

350KCMIL-15 KV SHIELDED POWER CABLE

- TYPE MV-105
- COPPER TAPE SHIELD
- EPR INSULATION 133% LEVEL, SINGLE CONDUCTOR, SUNLIGHT RESISTANT - DELIVER ON (6) 1000FT SPOOLS
- ACCEPTING OKONITE 115-23-3240 OR PRYSMIAN 306307A ONLY
- QUANTITY OF SIX THOUSAND(6,000)

ITEM 2

4/0 AWG CU

- 600 VOLT TYPE RHW-2
- OKOGUARD-OKOLON TS-CPE OR EQUAL
- QUANTITY OF TWO THOUSAND (2,000)