THE PORT AUTHORITY OF NY & NJ

PROCUREMENT DEPARTMENT
4 WORLD TRADE CENTER
150 GREENWICH STREET, 21ST FL.
NEW YORK, NY 10007

7/11/2016

ADDENDUM # 5

To prospective Bidder(s) on Bid # 46139 - Supply and Deliver Isolation Transformers and Shrink Kits, as Specified, to John F. Kennedy International Airport - Due back on 7/19/2016, no later than 11:00AM:

I. CHANGES/MODIFICATIONS

The following changes/modifications are hereby made to the solicitation document:

1. The attached Section specification 16120 is hereby made part of this Bid.

2. Material Number BE4000810:
   a) Change the quantity to 2,856 Kits
   b) Delete the description in its entirety and replace it with the following: "COLD SHRINK KIT, L-823, ONE COLD SHRINK PER ONE CONNECTION, TYPE 8428-6, 3M OR APPROVED EQUAL. PER PA SPECIFICATION 16000, 16542, 16129, 16120."

3. Material Number BE4000815:
   a) Change the quantity to 1,246 Kits
   b) Delete the description in its entirety and replace it with the following: "HEAT SHRINK KIT, CROUSE HINDS – HSK (2-PIECE), CATALOG NUMBER 10047-1425, OR APPROVED EQUAL. PER PA SPECIFICATION 16000, 16542, 16129, 16120."

II. BIDDER'S QUESTIONS AND ANSWERS

The following information is available in response to questions submitted by prospective Bidders. The responses should not be deemed to answer all questions which have been submitted by Bidders to the Port Authority. It addresses only those questions which the Port Authority has deemed to require additional information and/or clarification. The fact that information has not been supplied with respect to particular questions asked by Bidders does not mean or imply, nor should it be deemed to mean or imply, any meaning, construction, or implication with respect to the terms.

The Port Authority makes no representations, warranties or guarantees that the information contained herein is accurate, complete or timely or that such information accurately represents the conditions that would be encountered during the performance of the Contract. The furnishing of such information by the Port Authority shall not create or be deemed to create any obligation or liability upon it for any reason whatsoever and each Bidder, by submitting its Bid, expressly agrees that it has not relied upon the foregoing information, and that it shall not hold the Port Authority liable or responsible therefor in any manner whatsoever. Accordingly, nothing contained herein and no representation, statement or promise, of the Port Authority, its Commissioners, officers, agents, representatives, or employees, whether made orally or in writing, shall impair or limit the effect of the warranties of the Bidder required by this Bid or Contract and the Bidder agrees that it shall not hold the Port Authority liable or responsible therefor in any manner whatsoever.
The Questions and Answers numbering sequence will be continued sequentially in any forthcoming Addenda that may be issued.

Question #1	If guidance sign transformers are being replaced by this purchase, is the 6-foot secondary cable that connects the sign to the isolation transformer also required?
Answer #1	Yes

This communication should be initialed by you and annexed to your Bid upon submission. In case any Bidder fails to conform to these instructions, its Bid will nevertheless be construed as though this communication had been so physically annexed and initialed.

THE PORT AUTHORITY OF NY & NJ

SELENE ORTEGA, MANAGER
COMMODITIES & SERVICES DIVISION

BIDDER'S FIRM NAME: _____

INITIALED: _____DATE: _____

QUESTIONS CONCERNING THIS ADDENDUM MAY BE ADDRESSED TO JOHN SANTIAGO AT John.Santiago@panynj.gov OR (212) 435-4613.

DIVISION 16

SECTION 16120

WIRES, CABLES, SPLICES, TERMINATIONS

(600 VOLTS OR LESS)

PART 1. GENERAL

1.01 SUMMARY

This Section specifies requirements for wires, cables, splices, terminations, and appurtenances for electrical systems of 600 volts or less.

1.02 REFERENCES

The following is a listing of the publications referenced in this Section:

American Society for Testing and Materials (ASTM)

ASTM B 1	Hard-Drawn Copper Wire
ASTM B 2	Medium-Hard-Drawn Copper Wire
ASTM B 3	Soft or Annealed Copper Wire
ASTM B 8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B 33	Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
ASTM B 174	Bunch-Stranded Copper Conductors for Electrical Conductors
ASTM B 189	Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for Electrical Purposes
ASTM D 2802	Ozone-Resistant Ethylene-Alkene Polymer Insulation for Wire and Cable
ASTM D 3005	Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape
ASTM D 4388	Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes
ASTM E 662	Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

Insulated Cable Engineers Association (ICEA)

ANSI/ICEA S-95-658/ NEMA WC70	Nonshielded 0-2kv Cables
ANSI/ ICEA S-95-658 NEMA WC70	Power Cables Rated 2000 V or Less for the Distribution of Electrical Energy
ICEA T-33-655	Low Smoke, Halogen-Free (LSHF) Polymeric Cable Jackets

Institute of Electrical and Electronics Engineers (IEEE)

IEEE 383	IEEE Standard for Qualifying Electric Cables and Splices for Nuclear Facilities
IEEE 837	IEEE Standard for Qualifying Permanent Connections Used in Substation Grounding

Military Specifications

MIL C-24643	Cables, Electric, Low Smoke, Halogen-Free for Shipboard Use

National Fire Protection Association (NFPA)

NFPA 70	National Electrical Code

Naval Engineering Standards

NES 713	Determination of the Toxicity Index of the Products of Combustion From Small Specimens of Materials

Underwriters Laboratories Inc. (UL)

UL 44	Thermoset-Insulated Wires and Cables
UL 467	Grounding and Bonding Equipment
UL 510	Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
UL 854	Service-Entrance Cables
UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords
UL 1685	Standard for Vertical-Tray Fire-Propagation and Smoke-Release Test fo Electrical and Optical- Fiber Cables

1.03 QUALITY ASSURANCE

A. Wires and cables which have been manufactured more than two years prior to installation shall not be used in the Work of this Section.

B. Tapes for splices or terminations shall be dated by the tape manufacturer to indicate that they have been manufactured no longer than six months prior to use in the Work of this Section.

C. Polyvinyl Chloride (PVC): PVC-insulated power wiring and items containing PVC, except PVC-insulated wiring for communications systems, remote control, signaling, and power-limited circuits, shall not be installed in indoor area. PVC-insulated wiring for communications systems, remote control, signaling, and power-limited circuits shall be furnished and installed in accordance with NFPA 70.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Single conductor wire or cable sizes #4/0 AWG and larger that are to be installed in the same raceway shall be paralleled by the cable manufacturer prior to shipment. Cable assembly overall diameter shall be kept to a minimum.

B. Wire and cable sizes #4/0 AWG and larger shall be provided with factory-applied caps unless otherwise shown on the Contract Drawings. End seals shall be heat shrink, irradiated, modified polyolefin, and shall be sized for individual wires and cables.

C. Store material in a clean, dry space and protect it from the weather.

1.05 SUBMITTALS

See Appendix "A" for submittals requirements.

PART 2. PRODUCTS

2.01 WIRES AND CABLES

A. General

1. Definitions

a. Wire shall be defined as a solid or stranded conductor smaller than No. 6 AWG with or without insulation.

b. Cable shall be defined as a single conductor No. 6 AWG or larger, or two or more conductors of any size wire under a common covering.

2. Locations, types, sizes and numbers of wires and cables shall be as shown on the Contract Drawings. Where not indicated, furnish and install proper wire and cable to comply with this Section and NFPA 70 Standards.

3. Unless otherwise shown on the Contract Drawings, solid conductors shall be soft or annealed copper, conforming to ASTM B 33 (tinned), ASTM B 189 (lead-coated or lead-alloy coated), or ASTM B 3 (uncoated). Unless otherwise specified in this Section or unless otherwise shown on the Contract

Drawings, stranded copper conductors shall be concentric stranding conforming to ASTM B 8.

4. Unless otherwise shown on the Contract Drawings, cable jackets for interior use shall be low smoke, low toxicity, non-halogen, flame retardant type and shall meet the following performance characteristics:

   a. Cables shall pass the flame propagatory and smoke release criteria according to the test method of UL 1685.

   b. The halogen content of cable jackets shall not exceed 0.2 percent according to the test method of MIL-C-24643. The Authority classifies 0.2 percent or less halogen content as "non-halogen".

   c. The toxicity index of cable jackets shall not exceed 4.0 according to the test method of NES 713.

   d. The cable jackets shall comply with ICEA T-33-655 for smoke generation.

   e. The acid gas content of cable jackets shall not exceed a maximum of 3.0 percent according to the test method of MIL-C-24643.

5. Comply with the following additional performance characteristics for wires and cables which will be installed in subway areas, substations and tunnels where stringent flame retardency, low smoke, low toxicity, zero halogen and good circuit integrity during a fire are required.

   a. Wires shall pass the flame propagatory criteria according to the test method of VW-1 per UL 1581.

   b. The halogen content of both the wire and cable insulation and cable jacket(s) shall not exceed 0.2 percent according to the test method of MIL-C-24643. The Authority classifies 0.2 percent or less halogen content as "non-halogen".

   c. The toxicity index of both the wire and cable insulation and cable jacket(s) shall not exceed 2.0 according to the test method of NES 713.

   d. The acid gas content of both wire and cable insulation and cable jacket(s) shall not exceed a maximum of 2.0 percent according to the test method of MIL-C-24643.

   e. The wire and cable insulation materials shall pass the smoke generation test in accordance with ASTM E 662. Wire and cable insulation when tested on a specimen of 80 mils thick slab shall not exceed the following values:

Flaming Avg. Ds (4 minutes)	100
Flaming Avg. Dm (20 Minutes)	200
Non-Flaming Avg. Ds (4 minutes)	100
Non-Flaming Avg. Dm (20 minutes)	350

f. The cable jacket materials shall pass the smoke generation test in accordance with ASTM E 662. Wire and cable jacket when tested on a specimen of 80 mils thick slab shall not exceed the following values:

Flaming Avg. Ds (4 minutes)	50
Flaming Avg. Dm (20 minutes)	150
Non-Flaming Avg. Ds (4 minutes)	50
Non-Flaming Avg. Dm (20 minutes)	250

6. Color-Coding for Power and Lighting Conductors

a. Insulation or covering of wires and cables shall be factory color-coded by the use of colored compounds or coatings. The color-code shall be followed consistently throughout the performance of the Work.

b. Upon written request of the Contractor, the Engineer may permit the use of the following methods in lieu of the wire or cable manufacturer's color-coding, when limited quantities of wire and cable are involved, for sizes #8 AWG and larger.

(1) For dry locations only, spiral application of 3/4 inch wide, colored pressure sensitive plastic tape, half lapped for a distance of not less than six inches may be used. To prevent unwinding, the last two wraps of tape shall be applied with no tension.

(2) For wet or dry locations, application of three, 3/16 inch wide, colored, fungus-inert, self-extinguishing, self-locking, nylon cable ties spaced 3 inches apart may be used. The ties shall be snugly applied with a special tool or pliers, and any excess removed.

(3) Each wire and cable shall be color-coded at all terminal points, in all manholes, boxes, or other similar enclosures.

(4) Color markings shall be applied so as not to obliterate the manufacturer's identification markings.

c. Color code chart shall be as follows:

	System Voltage	
Conductor	208Y/120V	480Y/277V
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

7. All wires, cables, splices and terminations, for which there are established UL standards, shall bear the UL label.

B. General-Purpose Wires and Cables

Unless otherwise shown on the Contract Drawings, general purpose wires and cables shall be as follows:

1. General-purpose wires and cables shall be single conductor, ASTM B 8, Class B stranded for sizes #8 AWG and larger, and solid for sizes #10 AWG and smaller.
2. Select from the following list of UL wire and cable types:
   a. Type XHHW-2: Flame retardant, Cross-linked-polyolefin insulation, conforming to UL 44.
   b. Type USE: Heat and moisture resistant ethylene- propylene-rubber insulation with heavy duty thermosetting chloro-sulphonated polyethylene or heavy- duty neoprene jacket; multiple rated "USE-RHH-RHW"; conforming to ASTM D 2802, ICEA S-95-658, UL 44 and UL 854. Unless otherwise indicated, Type USE shall be the only wire and cable used for underground installations.

C. Grounding Wires and Cables

Unless otherwise shown on the Contract Drawings, grounding wires and Cables shall be as follows:

1. Insulated
   a. Solid for sizes #8 AWG and smaller; ASTM B 8, Class B stranded for sizes #6 AWG and larger; and of the same insulation type as the power conductors.
   b. Covering shall be a continuous green color and conform to ASTM B 33 and UL 44.
2. Uninsulated

   General

   a. Solid for sizes #8 AWG and smaller; ASTM B 8, Class B stranded for sizes #6 AWG and larger.
   b. In raceways

      Soft-drawn and conforming to ASTM B 3.
   c. Direct buried or encased in concrete

      Soft-drawn, medium-hard-drawn, or hard-drawn and conforming to ASTM B 1, B 2 or B 3, respectively.

D. Control Wires and Cables

Unless otherwise shown on the Contract Drawings, control wires and cables shall be as follows:

1. Single conductor wires and cables shall be ASTM B 8, Class B stranded, type XHHW or XHHW-2 flame retardant, cross-linked-polyolefin insulation. Both shall conform to UL 44 and ICEA S-95-658.

E. Switchboard Wires and Cables

Unless otherwise shown on the Contract Drawings, switchboard wires and cables shall be as follows:

1. Switchboard wires and cables shall be single conductor, ASTM B 8, Class B stranded, except that for wires and cables crossing hinged joints and swinging panels, and where "Extra Flexible" wire or cable is shown on the Contract Drawings, conductors shall be ASTM B 174, Class K stranded.

2. Wires and cables shall be Type SIS, cross-linked-thermosetting-polyethylene insulation, conforming to ICEA S-95-658, IEEE 383 and UL 44.

F. Cable Tags

1. Dry Locations

a. Fiberglass tags, 1/16 inch thick and 3/4 inch wide, indented with letters and numbers 5/16 inch high, with #14 AWG copper or nylon, weather resistant cable ties.

b. Lighting branch circuit wiring and single conductor signal and control wiring may be identified with "Quiklables" manufactured by W. H. Brady Company, or approved equal.

2. Wet Locations

Stainless steel metal tags, No. 28 gauge and 3/4 inch wide, embossed with letters and numbers 5/16 inch high, with #14 AWG copper or nylon, weather-resistant cable ties, or stainless steel cable ties.

2.02 SPLICING, TERMINATING AND ARCPROOFING MATERIALS

A. General

1. All splicing, terminating and arcproofing materials shall be compatible so that no one material will adversely affect the physical or electrical properties of any other, or of the wire or cable itself.

2. All materials for making splices and terminations shall be specifically designed for use with the type of wire or cable, insulation and installation and operating conditions of the specific application.

B. Connectors

Subject to compliance with requirements of this Section, furnish and install connectors of the following types:

1. Solderless, uninsulated, high conductivity, corrosion resistant, compression connectors conforming to UL 467 and IEEE 837;

2. Insulated, indenter type compression butt connectors;

3. Insulated, integral self-locking flexible shell, expandable spring connectors;

4. Uninsulated, indenter type compression pigtail connectors;

5. Welded type connectors.

C. Terminals

Subject to compliance with requirements of this Section, furnish and install terminals of the following types:

1. Solderless, uninsulated, high conductivity, corrosion resistant, compression terminals conforming to UL 467 and IEEE 837;
2. Insulated, compression terminals;
3. Solderless, high conductivity, corrosion resistant, hex screw type, bolted terminals;
4. Welded type terminals.

D. Shrinkable Tubing

Subject to compliance with requirements of this Section, furnish and install shrinkable tubing of the following types:

1. Either irradiated modified polyvinyl chloride or irradiated modified polyolefin heat shrinkable tubing;
2. Cold shrinkable tubing.

E. Tapes and Sealers

1. Vinyl Tapes

   Flame-retardant, cold and weather-resistant, 3/4 inch or 1-1/2 inches wide, as required, and conforming to UL 510 and ASTM D 3005.

   a. For interior, dry locations, provide 7 mils, conforming to ASTM D 3005 (Type I); Scotch (3M) No. 33, or approved equal.
   b. For exterior or damp and wet locations, provide 8.5 mils, conforming to ASTM D 3005 (Type II); Scotch (3M) No. 88, or approved equal.

2. Rubber Tapes

   Ethylene-propylene, rubber-based, 30-mil splicing tape, rated for 130 degrees C operation; 3/4inch and wider (1, 1 1/2, 2 inches) as shown on the Contract Drawings or approved by the Engineer, conforming to ASTM D 4388, Scotch (3M) No. 130C, or approved equal.

3. Insulating Putty

   Rubber-based, 125-mil elastic filler putty; 1 1/2 inches wide; Scotch (3M) Scotchfil, or approved equal.

4. Silicone Rubber Tapes

   Inorganic silicone rubber, 12-mil, 130 degrees C rated, anti-tracking, self-fusing tape; 1 inch wide; Scotch (3M) No. 70, or approved equal.

5. Sealer

   Liquid applied, fast-drying sealant; Scotch (3M) Scotchkote, or approved equal.

F. Resin Filled Splices

1. Epoxy Molded Type

   Two-piece, snap-together molded bodies, sized for wire or cable, with two-part low viscosity polyurethane insulating and sealing compound, rated for 600 volts, using crimp-type wire connector; Scotch (3M) No. 82-A1, 82-A2 or 82-A3 compound, or approved equal.

2. Re-Enterable Type

   Transparent, molded bodies clamped with stainless steel strain-relief bar and shield continuity connectors, sized for wire or cable, with loosely woven polyester spacer web and jelly-like urethane formulation for permanent re-entry capability; Scotch (3M) No. 78-R1 thru 78-R5, with No. 2114 compound, or approved equal.

G. Arcproofing Materials

1. Fire resistant tapes shall be Scotch (3M) No. 77, or approved equal.

2. Glass cloth binding tapes shall be Scotch (3M) No. 69, or approved equal.

H. Special splicing materials and methods shall be as shown on the Contract Drawings.

2.03 SHOP TESTS

A. For quantities as shown on the Contract Drawings, regular dielectric-withstand and insulation-resistance in water tests for wires and cables shall be performed in accordance with UL 44.

B. Flame tests for wires and cables shall be performed in accordance with IEEE 383.

C. The test results shall be certified for each reel/coil/box of wire or cable.

D. Factory inspection and witnessing of tests by the Engineer shall be required for all wires and cables furnished under this Contract. The Engineer reserves the right to require additional testing, or to waive factory inspection or witnessing of tests. The Contractor shall notify the Engineer 14 days in advance of the scheduling of such factory tests.

PART 3. EXECUTION

3.01 PREPARATION

A. Prior to pulling wires and cables, clean raceway systems of all foreign matter and perform all operations necessary so as not to cause damage to wires and cables while pulling.

B. Prior to pulling wires and cables into underground conduit systems, place a feeding tube approved by the Engineer at the entrance end of such systems.

3.02 INSTALLATION

A. Wire and Cable Installation

1. General

a. Keep wires and cables dry at all times.

b. Seal wire and cable ends with watertight end seals if splicing or terminating does not follow at once.

c. Before splicing or terminating wires and cables, make a thorough inspection to determine that water has not entered the wires and cables or that the wires and cables have not been damaged.

d. Use adequate lubrication when installing cables in conduits or raceways. Any pulling compounds shall be compatible with the finish of the wires and cables furnished.

2. General Purpose Wires and Cables

a. Minimum wire or cable size shall be #12 AWG for light and power service.

b. Wires or cables shall be at least #10 AWG for the entire length of branch circuits, where distances to first outlets are as follows:

(1) 100 feet or more on 480Y/277 Volt systems.

(2) 70 feet or more on 208Y/120 Volt systems.

3. Grounding Wires and Cables

a. Use bare, uninsulated wire and cable only where shown on the Contract Drawings or where approved by the Engineer.

b. Insulated grounding cable shall be of the type specified in this Section or as shown on the Contract Drawings.

4. Control Wires and Cables

Control wires and cables shall not be smaller than #14 AWG unless otherwise shown on the Contract Drawings.

B. Splicing and Terminating

1. General

Splicing and terminating shall be as specified in this Section. Details of special splicing and terminating shall be as shown on the Contract Drawings. Any splicing or terminating methods other than those specified below, for which the components are in accordance with the requirements of this Section, shall be submitted to the Engineer for approval.

2. General Purpose Wires and Cables

a. Splices in dry locations for sizes #10 AWG and smaller Splicing

shall be completed using one of the following:

(1) Insulated, integral, self-locking flexible shell, expandable spring connectors shall be applied to the twisted conductors. Two, half-

lapped layers of vinyl tape, extending to a distance of not less than one inch from the connector, shall be applied.

(2) Compression type, insulated butt connectors shall be applied to the butted conductors by means of an appropriate crimping tool, providing controlled indentation. Two, half-lapped layers of vinyl tape, extending to a distance of not less than one inch from the connector, shall be applied.

(3) Compression type, pigtail connectors shall be applied to the conductors by means of an appropriate crimping tool, providing controlled indentation. The connector shall be covered with a polyamide cap and two, half-lapped layers of vinyl tape, extending to a distance of not less than one inch from the connector, shall be applied.

b. Splices in dry locations for sizes #8 AWG and larger

Splicing shall be completed using all of the following:

(1) Connectors shall be split sleeve solderless type or solderless compression type.

(2) Fill indents of connectors with Scotchfil insulation putty or approved equal.

(3) Apply rubber splicing tape equal to the original insulation rating.

(4) Apply two, half-lapped layers of vinyl tape, or a shrinkable tubing.

c. Splices in wet locations

(1) Same as dry locations specified in 3.02B.2.a and 2.b, except that after vinyl tape is applied, cover with two coats of sealer or shrinkable tubing.

(2) Resin-filled splice shall be covered with two, half-lapped layers of vinyl tape and two coats of sealer or shrinkable tubing.

d. Terminations in dry locations for sizes #10 AWG and smaller

Terminations shall be compression terminals, insulated or uninsulated.

e. Terminations in dry locations for sizes #8 AWG through #3/0 AWG

(1) Ring tongue terminals shall be solderless, uninsulated compression crimp type.

(2) Ring tongue lugs shall be bolted hex screw type.

f. Terminations in dry locations for sizes #4/0 AWG and larger.

Ring tongue terminals shall be solderless, uninsulated compression crimp type.

g. Terminations in wet locations

In addition to the dry location terminations specified in 3.02 B.2.d, 2.e and 2.f, cover the entire termination area with two, half-lapped layers of vinyl tape and apply two coats of sealer over the tape.

3. Grounding Wires and Cables

   a. Splices and terminations shall be installed in accordance with the manufacturer's recommendations.

   b. In hazardous or classified locations, splices and terminations shall be solderless high conductivity, corrosion resistant, compression type connectors and terminations shall be clamp type pressure connectors, suitable for such use.

   c. All underground connections shall be covered with two coats of asphalt base paint.

4. Control Wires and Cables

   a. Splices shall be made in accordance with the requirements specified in 3.02 B.2.c and shall be enclosed in a re-enterable splicing case. Where shielded cable is shown on the Contract Drawings, the shielding shall be continued through the splice. Shields shall be grounded at one location only unless otherwise shown on the Contract Drawings.

   b. Terminations shall be insulated, indenter type ring tongue terminals.

5. Switchboard Wires

   a. No splices are permitted.

   b. Terminations shall be insulated, indenter type ring tongue terminals.

C. Arcproofing

1. Arcproofing shall be applied where shown on the Contract Drawings.

2. Arcproofing, which has been disturbed for any reason, shall be reinstalled as soon as possible after the disturbance.

3. Arcproofing shall be installed as follows:

   a. Wires and cables shall be grouped by circuit and arcproofing applied over the group of wires and cables comprising one circuit. Splices shall be arcproofed individually and the taping shall join with and be overlapped by the group taping.

   b. Arcproofing shall be applied in two wrappings of half-lapped tape, bound with glass cloth tape applied at the ends of the fire resistant tape, and at intervals not to exceed 24 inches along the entire length of the cables. The two wrappings shall be applied with opposing-lays.

   c. Arcproofing shall be extended into the conduit opening or end bell of the raceway entering a handhole, manhole or box.

   d. Arcproofing tape shall be 1 1/2 inches wide where the diameter of the individual cable, or of the circumscribed circle for the circuit group, is less than 1 3/4 inches. For larger diameters, the tape shall be 3 inches wide.

D. Identification of Wires and Cables

1. Each wire and cable shall be identified by its circuit in all cabinets, boxes, manholes, handholes, wireways and other enclosures and access locations, and at all terminal points.

2. The circuit designations shall be as shown on the Contract Drawings. Tags shall be attached to wires and cables in such a manner as to be readily visible.

3. The tag ties shall be wrapped around all conductors contained in the circuit or feeder to be identified.

4. Wires and cables which are arcproofed shall also be identified outside the applied arcproofing.

3.03 FIELD TESTS

Test all wires and cables up to equipment installed under this Contract with a 1000 volt Megohmmeter. Furnish the Engineer with a copy of the "Megger" readings together with an outline of the method used. If, in the opinion of the Engineer, any reading is lower than that required by applicable codes, promptly replace the materials involved, at no additional cost to the Authority, and retest.

END OF SECTION

SECTION 16120

WIRE, CABLES, SPLICES, TERMINATIONS

(600 VOLTS OR LESS)

APPENDIX “A”

SUBMITTALS

A. Submit Catalog Cuts for the following in accordance with the requirements of "Shop Drawings, Catalog Cuts, and Samples" of Division 1 - GENERAL PROVISIONS:

1. Wires and cables for each type and size;
2. Splice kit materials and installation procedures.

B. Submit certified shop test reports for wires and cables.

C. Submit field test results for wires and cables, including "Megger" readings with the test method used.

END OF APPENDIX "A"