



SPECIAL PROVISIONS  
FOR  
TELECOMMUNICATIONS OUTSIDE PLANT EQUIPMENT AND MATERIALS

JOHNSON COUNTY  
STP-U-3715(654)--70-52

**Effective Date**  
October 16, 2012

THE STANDARD SPECIFICATIONS, SERIES OF 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS. THESE ARE SPECIAL PROVISIONS AND SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS

**PART 1 GENERAL**

**1.01 - Section Includes**

- A. HDPE duct
- B. HDPE mechanical coupling
- C. Duct plug
- D. Pull tape
- E. Handhole and cover
- F. Ground bar and termination hardware
- G. Geotextile materials
- H. Locate / tracer wire

**1.02 - Code Compliance**

- A. All work and materials shall comply with the most recent rules, codes, and regulations, including but not limited to the following:
  - 1. Occupational Safety and Health Act Standards (OSHA)
  - 2. NFPA 70 - National Electrical Code (NEC)
  - 3. ANSI/IEEE C-2, 1997 National Electrical Safety Code
  - 4. All other applicable Federal, State, and local laws and regulations

**1.03 - Submittals**

- A. Submit product data for each of the following:
  - 1. HDPE duct
  - 2. HDPE mechanical coupling
  - 3. Duct plug
  - 4. Pull tape
  - 5. Handhole and cover
  - 6. Ground bar and termination hardware
  - 7. Geotextile materials
  - 8. Locate / tracer wire
- B. Submittal Procedures
  - 1. Within five working days after receipt of the Contract and prior to the pre-construction conference or any payments, the Contractor shall submit to the Owner for timely review a schedule of submittals listing each required submittal as identified in Paragraph 1.03-A.
  - 2. Submit the following information for approval prior to ordering and installation into the project.
    - a. Manufacturer name
    - b. Manufacturer part number
    - c. All relevant specification and description information necessary for the Owner to validate that the material submitted is in fact the material specified.
  - 3. Transmit each submittal with transmittal letter indicating: date, project title, and contractor's name and address.
  - 4. Apply Contractor's stamp. Sign or initialed submittal certifying that review, verification of products required, and dimensions are in accordance with the requirements of the work and Contract Documents.
  - 5. Submit the number of copies that the Contractor requires, plus three (3) copies that will be retained by the Owner. Mail or deliver submittals to:

City of Iowa City  
Attn: Jason Havel, P.E.  
410 East Washington Street  
Iowa City, IA 52240

- 6. Submittals will be reviewed by the Owner and Design Professional and returned to the Contractor either approved as submitted, approved with comments, or rejected with comments. If rejected, Contractor shall correct and resubmit as required, identifying all changes made since previous submittal.
- 7. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

**1.04 - Manufacturer's Instructions**

- A. When specified in specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for Shop Drawings and materials brochures.

- B. Unless otherwise stated, where installation requirements identified in the Standards conflict with the manufacturer's recommendations, the more restrictive shall be applied.
- C. Notify Engineer of conflicts between manufacturers' instructions and Contract Documents.

### 1.05 - Quality Assurance

- A. Full compliance with engineered design and specifications is required. Performance criteria included in the references shall be met. Test data shall verify system performance.

## PART 2 PRODUCTS

### 2.01 - Materials

- A. HDPE Duct
  - 1. Acceptable Manufactures: Endot, Arnco, Carlon, Dura-line, or approved equal.
  - 2. Product Description: High Density Polyethylene (HDPE), ASTM D 3035, SDR 11. UL Listed, smooth interior and exterior wall. Non-plenum rated.
  - 3. Nominal Size: 2" (nominal) controlled outside diameter, for underground installations.
  - 4. Color: orange; solid color.
  - 5. Fittings and Duct Bodies: Manufacturer's recommended fittings and components to make the system work.
- B. HDPE Mechanical Coupling
  - 1. NOTE: Ducts may also be field-joined using approved fusion methods.
  - 2. Acceptable Manufactures: ETCO
  - 3. Product Description: Mechanical coupling, double E-Loc coupling for HDPE-to-HDPE connections in restrained and unrestrained installation locations. Threaded end caps with nylon compression bushing.
  - 4. Nominal Size: Sized for 2" HDPE, SDR 11.
- C. Duct Plugs
  - 1. Product Description: Expandable blank duct plug for 2" HDPE, SDR 11. Solid, elastomeric-gasket with pull-rope loop.
- D. Pull Tape
  - 1. Composition: Woven polyester.
    - a. Pulling Strength: minimum of 1250 lbs.
    - b. Pull tape shall have permanent sequential footage markings.
- E. Handholes
  - 1. Acceptable Manufactures: Hubbell Quazite or approved equal.
  - 2. Product Description:
    - a. Handhole box: polymer-concrete, ANSI Tier 22, open bottom, with 4" mouse-hole on two ends.
    - b. Handhole cover: polymer concrete, ANSI Tier 15, heavy duty, two-piece, two bolts, logo to read "Fiber Optics". Cover bolts shall be 3/8" stainless steel, penta-head with washers.
  - 3. Nominal Size: Nominal handhole size shall be 30" wide x 48" long x 36" deep.
  - 4. Color: gray.

F. Ground Bar and Termination Hardware

1. Product Description: Copper ground bars with dimensions measuring 1/4” x 1” x 9” shall be furnished and installed with telecommunication handholes. The ground bars shall have 5 1/4 – 20 tapped holes with insulators and panhead torx screws.

G. Geotextile Materials

1. Product Description: Woven geotextile, polypropylene resin fiber material shall be furnished and installed with telecommunication handholes. Minimum Average Roll Values (MARV) shall be as follows:

		MARV
PROPERTY	TEST METHOD	ENGLISH
MECHANICAL		
Tensile Strength (Grab)	ASTM D-4632	200 lbs
Elongation	ASTM D-4632	12%
Puncture	ASTM D-4833	90 lbs
CBR Puncture	ASTM D-6241	700 lbs
Mullen Burst	ASTM D-3786	400 psi
Trapezoidal Tear	ASTM D-4533	75 lbs
ENDURANCE		
UV Resistance (% Retained at 500 hrs)	ASTM D-4533	70%
HYDRAULIC		
Apparent Opening Size (AOS) <sup>3</sup>	ASTM D-4751	40 US Std. Sieve
Permittivity	ASTM D-4491	0.05 sec <sup>-1</sup>
Water Flow Rate	ASTM D-4491	4 gpm/ft <sup>2</sup>

H. Locate / Tracer Wire

1. Product Description: Copper conductor, 45 MIL thick HDPE jacket, 12 AWG (or 10 AWG) solid copper conductor, designed for direct bury, orange in color.

**PART 3 EXECUTION****3.01 - HDPE Duct Installation**

- A. HDPE duct shall be installed at a depth of 36" to 42" of cover below grade. Minimum cover shall be 36" unless otherwise noted. Crossings of known and identified utilities and obstructions require variance to maximum and minimum depths specified. When a depth of 36" to 42" cannot be maintained notify the Owner's representative to determine maximum allowable depth. Provide additional cover as required by State, City, other utilities and authorities having jurisdiction where applicable or as necessary to traverse other utilities.
- B. Maintain a minimum 12" horizontal separation between other communication utilities and piped fluids. Maintain a minimum 3" horizontal separation from power and foreign conduits. Maintain a minimum 60" horizontal separation from water mains. At crossings provide a minimum vertical separation of 6" from conduits, ducts, cable and piped fluids. Notify Owner's representative for variances.
- C. Contractor is required to maintain positive drainage along the route throughout the duration of the project. All necessary dewatering shall be provided at no additional cost to the Owner.
- D. Provide pull tape in each HDPE duct in each segment of the route. Secure pull tape to duct plug at each end.
- E. HDPE duct shall extend into handholes and turn up. See detailed drawings for handhole installation.
- F. HDPE duct shall be installed using the industry standard installation equipment and methods.
- G. A site survey of the installation of the duct shall be made by the Contractor prior to beginning work.
- H. Cut duct square using a saw or pipe cutter; de-burr cut ends.
- I. Duct shall be field-joined by either fusion methods or mechanical couplings. Use only those mechanical couplings specified. As-built markups shall reflect the station number of coupled joints.
- J. Plug both ends of unused duct using approved duct plugs. Protect installed duct against entrance of dirt and moisture before and after installation.
- K. Manufacturer's recommended installation tension shall not be violated.
- L. Damaged HDPE duct shall be replaced with new.
- M. Test each segment of new HDPE duct for excessive deflection and collapse using a test mandrel no smaller than 80% of inside diameter of the duct. The test shall be conducted after the trench has been backfilled and compacted to the required finished grade according to project specifications.

**3.02 - Handhole Installation**

- A. Refer to the detailed drawings for handhole installation details.
- B. Unless otherwise noted, handholes shall be installed level with grade, flush and parallel to streets and sidewalks. If necessary, slope the area around the handhole, within a few feet, to direct drainage away from the handhole. Provide fill around handhole and compact near to 90% modified standard proctor density using a vibrating rammer compaction machine with appropriate sized foot and compacting around handholes in 8" to 12" lifts
- C. All dirt, debris, trash, packaging, tape, etc., resulting from work associated with the project shall be cleaned from handholes prior to acceptance of the project work. The rim of the

handhole shall be cleaned and the cover bolted down when work is complete. All bolts shall be accounted for.

- D. Open handholes shall be sufficiently barricaded.

#### **PART 4 METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

##### **4.01 - Method of Measurement**

Measurement for Telecommunications Outside Plant Equipment and Materials will be as follows:

- A. IT / Interconnect HDPE duct, 2 inch diameter  
Linear feet (LF) shown in the contract documents.
- B. IT / Interconnect pull tape for HDPE duct  
Linear feet (LF) shown in the contract documents.
- C. IT / Interconnect handhole, 30"x 48"  
By count (EA).
- D. IT / Interconnect tracer wire for HDPE duct  
Linear feet (LF) shown in the contract documents.

##### **4.02 - Basis of Payment**

Payment for Telecommunications Outside Plant Equipment and Materials will be as follows:

- A. IT / Interconnect HDPE duct, 2 inch diameter (LF)  
The unit price shall be full compensation for furnishing all materials, equipment, and labor for the installation of conduit of the given type and diameter. The unit price shall also include trenching or pushing, backfilling, compacting, surface restoration, HDPE duct, HDPE mechanical couplings, and duct plugs.
- B. IT / Interconnect pull tape for HDPE duct (LF)  
The unit price shall be full compensation for furnishing all materials, equipment, and labor for the installation of pull tape of the given type.
- C. IT / Interconnect handhole, 30"x 48" (EA)  
The unit price shall be full compensation for furnishing all materials, equipment, and labor for the installation of handholes and covers of the given size and type. The unit price shall also include excavation, backfilling, compacting, surface restoration, polymer concrete handhole box and cover, stainless steel cover bolts, geotextile woven fabric, granular base, and ground bar and termination hardware.
- D. IT / Interconnect tracer wire for HDPE duct (LF)  
The unit price shall be full compensation for furnishing all materials, equipment, and labor for the installation of tracer wire of the given size and type.

**END OF SPECIAL PROVISION**