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HDPE Solid Wall Conduit Model Specification Power and Communications Conduit and Casing

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HDPE Solid Wall Conduit Model Specification
Power and Communications Conduit and Casing

The user may choose to adopt part or all of this Model Specification; however, the user should ensure that all parts used are appropriate for the user's purpose. See notice below.

1. General Terms and Conditions

1.1. Scope: This specification covers requirements for flexible solid wall high-density polyethylene (HDPE) communications and power conduit and casing manufactured according to ASTM F 2160 for above ground use and below ground use by direct burial or trenchless installation.

1.2. Engineered and Approved Plans: Communications and power conduit and casing installation and construction shall be performed in accordance with engineered construction plans for the work prepared under the direction of a Professional Engineer.

1.3. Referenced Standards: Where all or part of a Federal, State or Local, ASTM, ANSI, NEMA, UL, etc., standard specification is incorporated by reference in these Specifications, the reference standard shall be the latest edition and revision.

1.4. Licenses and Permits: A licensed and bonded General Contractor shall perform all communications and power conduit and casing construction work. The Contractor shall secure all necessary permits before commencing construction.

1.5. Inspections: All work shall be inspected by an Authorized Representative of the Owner who shall have the authority to halt construction if, in this opinion, these specifications or standard construction practices are not being followed. Whenever any portion of these specifications is violated, the Project Engineer or his Authorized Representative shall, by written notice order further construction to cease until all deficiencies are corrected. A copy of the order shall be filed with the Contractor's license application for future review. If the deficiencies are not corrected, performance shall be required of the Contractor's surety.

2. High Density Polyethylene Solid-Wall Conduit and Casing

2.1. Qualification of manufacturers: The manufacturer shall have manufacturing and quality control facilities that are capable of producing and assuring the quality of the conduit or casing required by these specifications. The manufacturer's production facilities shall be open for inspection by the owner or his Authorized Representative.

The conduit and casing manufacturer shall have a documented quality management system that defines product specifications and manufacturing and quality assurance procedures that assure conformance with customer and applicable regulatory requirements.

2.2. Approved Manufacturers: Manufacturers that are qualified and approved by the Project Engineer are listed below. Products from unapproved manufacturers may be submitted for approval at the discretion of the Project Engineer. .

(Insert Company Name and Address of approved suppliers.)

2.3. Materials: Materials used for the manufacture of polyethylene conduit and casing shall be high-density polyethylene in accordance with ASTM F2160 requirements. Non-black materials shall not be used above ground

2.4. Size and Dimensions: HDPE conduit and casing shall be manufactured to the dimensions and requirements of ASTM F2160.

2.4.1. Other sizes and requirements shall be acceptable by advance mutual agreement between the customer (Owner, Purchaser or Project Engineer as appropriate) and the manufacturer.

(Note: Purchaser input conduit sizes required – SDR, SIDR, etc…)

2.4.2. Ovality of 2 inch and smaller conduit shall not exceed 7% off the coil. Coiled conduit larger than 2 inch through 3 inch IPS shall not exceed 10%. Ovality in coiled 4 inch and greater diameter conduit and casing is largely a packaging condition where greater than 15% ovality shall be corrected in the field by processing the roundable conduit through re-rounding and straightening equipment during installation.

2.4.3. Straight lengths of conduit shall have ovality of 5% or less.

2.4.4. For below ground use, in addition to solid wall colors, permanent color identification shall be available either as stripes or as a coextruded skin. In either case the color layer shall be permanently bonded to the main body and exhibit the same chemical and mechanical properties as the underlying material. Colored conduit shall maintain its color for a period of 1 year when stored outside, or as otherwise agreed to by the specifier and producer.

Striped conduit shall have a minimum of 3 equally spaced stripes of sufficient width and color intensity to be easily distinguished from a distance of 10 feet and from any angle.

Solid yellow or black with yellow stripes shall not be used for identification of conduit due to risk of misidentification with gas pipe.

2.4.5. Friction reduction shall be available in the form of lubrication and/or interior ribbing. Ribbing shall not be sharp or severe.

Factory pre-lubrication shall be performed with materials or agents that provide a permanent stable treatment and result in a coefficient of friction </= 0.15. Lubricants shall be compatible with both conduit and cable jacket materials.

2.4.6. Pull media, if required, shall be available pre-installed into the conduit. Media shall consist of high tensile fiber tapes or rope. Tapes shall be pre-lubricated with sequential length marks. Sufficient slack shall be available in the tapes to prevent binding when paying the conduit out of the coil.

Conduit shall be permanently marked in accordance with ASTM F 2160.

2.5. Compliance Tests: Manufacturer's inspection and testing of materials – In case of conflict with Manufacturer's certifications, the Contractor, Project Engineer, or Owner may request retesting by the Manufacturer or have retests performed by an outside testing service. All retesting shall be at the requestor's expense and shall be performed in accordance with these Specifications.

2.5.1. Standard testing requirements are those noted in ASTM F2160 and include: Dimensional evaluation, elongation at break and low-temperature impact.

2.5.2. When specified in the purchase order or contract, a manufacturer's certification shall be furnished to the purchaser that the conduit was manufactured, sampled, tested and inspected in accordance with this Specification and found to meet the requirements.

3. Joining

3.1. HDPE conduit may be joined by mechanical couplings as long as high tensile loads, such as during pullback in horizontal directional drilling, are not encountered. Mechanical joint adapters, transition fittings, grooved couplings, threaded couplings and compression couplings may be used. The joining device manufacturer's recommendations shall be observed when making mechanical connections.

3.2. Electrofusion fittings may be used and are recommended for high-tensile applications.

3.3. Butt fusion may be used for casing applications where the inner bead does not interfere with cable insertion.

3.4. Extrusion welding, and hot gas welding shall not be used.

4. Construction and Installation:

4.1. Underground Installation: Underground installations using open cut and burial techniques shall be performed in accordance with ASTM D2321 or as specified by the Project Engineer. The contractor shall observe all appropriate safety requirements in accordance with local, state and federal codes and regulations.

4.2. Horizontal Directional Drilling (HDD) applications are to be performed as specified by the Project Engineer or/and in accordance with ASTM F1962, *"Polyethylene Pipe for Horizontal Directional Drilling"* published by the Plastics Pipe Institute (PPI), and *"Mini Horizontal Directional Drilling Manual"* published by the North American Society of Trenchless Technology (NASTT).

4.3. Conduit sizing and placing shall be consistent with the recommendations provided by *"Polyethylene Duct and Conduit*", Chapter 13 of the PPI *Handbook of Polyethylene Pipe*.