

**SECTION 4  
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## **SECTION 4 DIRECTIONAL DRILLING**

### **4.1 GENERAL**

The section covers the work, including all labor, machinery, construction equipment and materials required for providing horizontal directional drills where indicated on the Drawings. Directionally drilled piping shall be installed to the lines and grades indicated on the Drawings. Care shall be taken to prevent damage to the surrounding area and to private property.

#### **4.1.1 Submittals**

The Contractor shall submit to the City of Groveland, a directional drilling plan as a shop drawing submittal, which shows any areas proposed to be directionally drilled other than those shown on the Drawings.

#### **4.1.2 Requirements**

- A) All horizontal directional drilling materials and methods shall meet the requirements of the current Section 555 – Horizontal Bore of the FDOT Standard Specifications. Materials shall be in accordance with ASTM D2447, ASTM D3350, ASTM F714 and ASTM D2513.
- B) The method and equipment used in directional drilling operations shall be of adequate commercial size and in satisfactory working condition for safe operations, and may be subject to approval by the City at the discretion of a representative of the Public Works Director (City designee). Such approval, however, shall in no way relieve the Contractor of the responsibility for making a satisfactory installation meeting the criteria set forth herein. Only workmen experienced in equipment operations shall be used in performing the work. It shall be understood that when a change in construction method or any increase in limits as specified herein is requested by the Contractor and authorized by the City, payment for the work will be based on the Contract price originally bid.
- C) The Contractor and the City designee shall walk the project site prior to construction to determine if any specific areas may be more conducive to directional drilling in lieu of open cutting in order to minimize surface disturbances. With the City's approval, certain areas (e.g., cul-de-sacs and areas with established landscaping) may have pipelines installed by the directional drilling method provided all other requirements stipulated are satisfied.
- D) If the Contractor determines it is to its advantage to extend directional drills for longer distances than called out for on the Drawings, such as for crossing multiple driveways, etc., with a single bore in lieu of trenching between bores as indicated, payment for the additional length will be made on the basis of the unit cost per foot for the type of pipe and installation (trenching) shown on the Drawings for the segment.

## **4.2 MATERIALS:**

### **4.2.1 Materials Specs.**

Unless otherwise shown on the Drawings or provided elsewhere in these Specifications, directionally drilled pipe shall be construction of High Density Polyethylene (HDPE), minimum SDR 11, having a pressure rating of 160 psi. HDPE used for potable water mains shall comply with AWWA Standard C906 and be approved by the National Sanitation Foundation (NSF) for potable water use. A continuous blue stripe shall be provided on two sides. HDPE used for sanitary sewers shall be provided with a continuous green stripe on two sides. HDPE used for reclaimed water shall have a continuous purple stripe on two sides.

### **4.2.2 Transition Couplings**

Transition couplings shall be provided for HDPE pipe to ductile iron mechanical joint fillings, integrally restrained for a minimum design pressure of 160 psi.

## **4.3 INSTALLATION REQUIREMENTS**

4.3.1 Directional drilling operations shall be performed by individuals certified by the manufacturer as experienced operators.

4.3.2 The directional drilling system shall produce a small diameter tunnel providing a minimum cover of 36" over the installed pipe.

4.3.3 HDPE piping shall be field cut, with no joints under water body crossings or other areas having limited future accessibility. If joints are required elsewhere, fusion seams shall be butt weld joints.

4.3.4 Fusion Seams on HDPE directionally drilled pipe shall be pressure leakage tested above grade prior to in ground placement, at a minimum hydrostatic test pressure of 150 psi.

4.3.5. HDPE piping shall have a Type TWH insulated PVC copper conductor, #10 solid strand wire taped to the pipe at equally spaced intervals at a maximum of four feet

4.3.6 Directional drilling operations shall be done with continuous installation, at a smooth constant speed, until the directional drilling pipe is in final position. Correct line and grade shall be carefully maintained. After successful installation of the carrier pipe, the CONTRACTOR shall immediately remove all soil and debris, which may have collected in the carrier pipe during installation and dispose of properly. Flushing and pigging shall be required to clean the pipe.

4.3.7 At no time during the installation shall the tension stress on pull back, as calculated by pull-nose strain versus time interval of pull, exceed 90% of the total yield force of the pipe being pulled.

- 4.3.8 The pull-nose shall be pulled a minimum of 4% extra length and allowed to stand overnight to allow for stretch recovery and thermal contraction to an equilibrium temperature.
- 4.3.9 HDPE pipe installation shall produce no upheaval, settlement, cracking, movement or distortion of the existing surface or utilities. Following placement of the HDPE pipe, HDPE to Ductile Iron MH Transition fittings are to be installed on each end.
- 4.3.10 Only drilling fluids and lubricants having no potential adverse environmental effects shall be used. All drilling fluids shall be directed away from water bodies and comply with the requirements of USCOE, FDEP and the water management district having jurisdiction over the area of the Project. Drilling fluids from the borehole shall be contained and removed from the site upon completion of the bore.
- 4.3.11 The HDPE directional drilling pipe shall be adequately protected to prevent crushing or other damage.
- 4.3.12 Pits for directional drilling shall be excavated and maintained to the minimum dimension. Said excavations shall be adequately barricaded, sheeted, braced and dewatered, as required elsewhere in these specifications. The Contractor shall follow the requirements of OSHA and the Florida Trench Safety Act.
- 4.3.13 The Contractor shall be fully responsible for all directional drilling installed. The Contractor at its expense shall repair any noticeable surface defects resulting from improper operation of this drilling equipment.

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