

**DIRECTIONAL DRILLING SPECIFICATIONS**

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**1. GENERAL**

Directional drilling shall include all work necessary for the installation of the one and one quarter (1- ¼") inch through six (6") high density polyethylene (H.D.P.E.) pressure sewer pipe as shown on the drawings and as specified herein. Services provided by the Contractor shall be performed in accordance with the best industry practice and these Contract Documents. The Contractor shall furnish all labor, equipment and materials necessary to accomplish the work.

**2. INSPECTION**

The Contractor will at all times provide and maintain instrumentation which will accurately locate the pilot hole and measure drilling fluid flow discharge rate and pressure. The Engineer will have access to these instruments and readings at all times.

**3. SUBMITTALS**

A. Prior to commencing directional drilling, the Contractor shall submit to the Engineer details of equipment and detailed working drawings describing the proposed method of directional drilling. This shall include arrangement of equipment, location and size of drilling and receiving pits, method of dewatering, method of removing spoils material, size carrier pipe, method of fusing pipe segments, type wire, carrier pipe end seals, support segments, and method of abandonment of pilot hole. Sufficient material shall be submitted to show compliance with the Contract Documents and to show that articles proposed for use in the work are acceptable.

All drawings, catalog cuts and other descriptive data covering several related items in the same system shall be submitted at the same time in order that their complete integrated applicability in the entire system be adequately reviewed.

B. Bentonite/drilling mud; product information, material specifications, handling procedures, special precautions required, and method of mixing and installation.

**4. MATERIALS**

Materials shall be as specified in Section 15. of Low Pressure Sewer Specifications, Page LPS-7 through LPS-9.

**5. INSTALLATION OF PILOT HOLE**

**A. Directional Tolerance**

The pilot hole shall be drilled along the path shown on the Plan and Profile drawing to the following tolerances:

- (1) Elevations – Plus or minus six (6") inches.
- (2) Alignment – Plus or minus six (6") inches.
- (3) Curve Radius – No curves will be accepted with a radius less than that shown on the Plan and Profile drawing.

**B. As-Built Survey**

At the completion of the pilot hole drilling, the Contractor shall provide a tabulation of coordinates referenced to the drilled entry point which accurately describe the location of the pilot hole.

**6. REAM AND PULL BACK**

**A. Prereaming**

Prereaming operations shall be conducted at the discretion of the horizontal drilling contractor. All provisions of this specification relating to the simultaneous reaming and pilling back operations shall also pertain to prereaming operations.

**B. Pulling Loads**

The maximum allowable tensile load imposed on the pipeline pull section shall not exceed the following amounts:

<u>Nominal Size</u>	<u>Allowable Tensile Load</u>
1-1/4"	860 lbs.
2"	1760 lbs.
3"	3830 lbs.
4"	6330 lbs.
6"	13730 lbs.

The amount of pull applied to the pipe shall be controlled and limited by devices such as hydraulic pressure regulator or a load sensor between the pulling equipment and the pipe.

**C. Torsional Stress**

The amount of pull applied to the pipe shall be controlled and limited by devices such as hydraulic pressure regulator or a load sensor between the pulling equipment and the pipe.

**D. Pull Section Support**

The pull section shall be supported as it proceeds during pull back so that it moves freely.

**E. A metallic detection wire shall be pulled along with the carrier pipe.**

**7. DRILLING FLUIDS**

**A. Composition**

No drilling fluid will be utilized that does not comply with all environmental regulations.

**B. Disposal**

Disposal of drilling fluids shall be the responsibility of the Contractor and shall be conducted in compliance with all relative environmental regulations, right-of-way and work space agreements.

**C. Inadvertent Returns**

Drilling fluid returns at locations other than the entry and exit points shall be minimized. The Contractor shall immediately clean up any inadvertent returns.

**8. DRILLING WATER**

The Contractor is responsible for transporting and storing any water required for drilling and hydrostatic testing. Securing permission to use water from any other source is the responsibility of the Contractor.

**9. EXCESS DRILLING FLUID DISPOSAL**

Excess drilling fluid may be disposed of at a pre-approved location. The Contractor is responsible for transporting all excess fluids to the disposal site and paying any disposal costs.

**10. COMPLETION OF INSTALLATION**

After installation of the force main is complete, drilling pits and receiving pits shall be backfilled as specified in the General Specifications.