



## **SECTION 02415**

### **HORIZONTAL DIRECTIONAL DRILLING AND BORING**

#### **PART 1. GENERAL**

##### **1.1 DESCRIPTION**

This section covers the work necessary for installation of pipelines by directionally controlled horizontal drilling or boring equipment.

##### **1.2 SCOPE OF WORK**

- A. Fabricate, directionally drill or bore and install the pipeline to the approximate lines and grades shown on the project plans.
- B. Pressure test the pipeline section before installation; Pressure test the pipeline section after installation.
- C. Clean up all affected sites, and restore all areas to pre-construction or better condition.
- D. The CONTRACTOR shall deliver the pipeline to KUB in a clean and operable condition. The pipe shall be internally cleaned with a suitable type pig cleaner as approved by KUB. The cleaning must be conducted with a KUB approved pig. All water must be removed from the pipeline as required by KUB.
- E. If requested by KUB, the CONTRACTOR shall provide three copies of complete as-built drawings. As-builts shall include plan view and profile view.

##### **1.3 SUBMITTALS**

- A. The CONTRACTOR shall prepare a schedule for the work and submit it to KUB for approval. The schedule shall include all major tasks to be performed including the following:
  - 1. Rig mobilization and setup
  - 2. Pipe assembly
  - 3. Pilot hole drilling
  - 4. Pre-reaming
  - 5. Pretesting and pigging pipe before installation
  - 6. Pipe pulling
  - 7. Pretesting and pigging pipe after installation
  - 8. Restoration and demobilization



- B. At least 10 days prior to mobilization of equipment, the CONTRACTOR shall submit a detailed installation plan to KUB for review and approval. This plan must also include a detailed description as to contingencies for potential fissures of drilling fluid.
- C. The CONTRACTOR will supply Material Safety Data Sheets (MSDS) for all material used in making up drilling fluids. The drilling fluid composition must meet all federal, state and local laws and environmental regulations governing the use, handling, storage and disposal of such material.

#### 1.4 PERMITS

- A. The CONTRACTOR shall maintain and operate all construction equipment and perform all work within designated easements, temporary construction easements, working areas, public rights-of-way, and access roads.
- B. The CONTRACTOR shall be responsible for obtaining all permits and regulatory authorizations for activities off the defined easements and working areas, including any permits required for mobilizing materials and equipment and disposal of drilling fluids and industrial debris. The CONTRACTOR will be responsible for paying all fines that may be imposed due to illegal discharge.

### PART 2. PRODUCTS

#### 2.1 GENERAL

The CONTRACTOR shall provide all materials, equipment and labor for completing the drill/bore and for adequate protection of the work.

#### 2.2 EQUIPMENT AND MATERIALS TO BE FURNISHED BY CONTRACTOR

The CONTRACTOR shall furnish all equipment and material required to complete the Scope of Work which shall include but not be limited to the following:

1. Drilling equipment
2. Water pumps, hoses, fittings, storage tanks, filters, hay bales, and silt fencing (as required).
3. Drilling fluids containment, collection, cleaning and disposal equipment, and material.
4. Fuel and lubricants.
5. Bentonite and related mixing equipment.
6. All welding equipment and materials as required.
7. All hydrostatic and pneumatic testing equipment and materials.
8. Sidebooms, cranes, backhoes, trucks and other equipment and materials necessary to load and unload pipe and to support and smoothly



- transition the pipe while being pulled into the reamed hole.
9. All equipment and materials necessary to restore project areas to pre-existing condition or better.

## PART 3. EXECUTION

### 3.1 INSTALLATION

- A. General: The CONTRACTOR shall install the section of the pipeline by the horizontally drilled or bored, directionally controlled method of construction. This method shall consist of the drilling of a pilot hole within the designed tolerances for radius requirements, followed by enlargement of the hole to accommodate the product line.
- B. Instrumentation: The CONTRACTOR will at all times provide and maintain instrumentation which will accurately locate the pilot hole position relative to ground surface. Drill fluid flow rate and pressure must also be monitored. CONTRACTOR shall maintain and provide to KUB/OWNER, upon request, access to the data generated by the downhole survey tools.
- C. Tolerances:
  1. Pipe installed by horizontal directional drilling or boring must be located as shown on the project drawings. The CONTRACTOR shall employ experienced personnel to operate the directional drilling or boring equipment and the monitoring and steering equipment. At the completion of the pilot hole the CONTRACTOR shall provide KUB with the coordinates of the pilot hole as specified.
  2. A smoothly drilled pilot hole shall follow the design centerline of the pipe profile and alignment described on the project drawings.
  3. The pilot hole (Borehole Entry Point) shall penetrate the ground surface at the approximate location shown on the project drawings.
  4. The course of the pilot hole must stay within the given right-of-way at all points along the drilled route.
  5. The CONTRACTOR shall have accurate working gauges, which register tensile force being used to pull the pipeline back through the reamed borehole. It is the CONTRACTOR's responsibility to prepare the reamed out hole such that pulling back operations do not exceed the tensile strength of the pipe. The CONTRACTOR shall provide estimated calculations for the pulling loads and allowable loads before pull back operations begin. If during the pipeline pulling process this force reaches 75% of the allowable load for the pipeline, the project inspector must be notified

immediately. Logs must be kept intact referencing all forces exerted on the pipeline during the project.

6. The CONTRACTOR shall provide adequate supports along the stringing area to protect the pipe and allow free movement of the pipeline during pullback.
7. During pullback operations, CONTRACTOR shall monitor roller operation and use sidebooms if required to assist movement of the pipe. Situations which could cause damage to the pipe material, shall be corrected immediately. Damaged pipe shall be repaired to the satisfaction of the OWNER or replaced by the CONTRACTOR before pulling operations resume.

### 3.2 DRILLING MUD AND CUTTINGS

- A. The Horizontal Directional Drilling or Boring operation is to be operated in a manner to eliminate the discharge of water, drilling mud and cuttings to water or land areas involved during the construction process. CONTRACTOR shall immediately contain and clean up any inadvertent returns.
- B. Disposal of drilling fluids shall be the responsibility of the CONTRACTOR and shall be conducted in compliance with all relative environmental regulations, easement and workspace agreements and permit requirements. All costs related to disposal shall be the responsibility of the CONTRACTOR.
- C. Transportation, makeup and Material Safety Data Sheets (MSDS) for drilling fluids shall be provided to KUB.
- D. Water supply is the CONTRACTOR's responsibility, whether purchased locally or hauled in.
- E. Drilling fluids must be free of all additives that will adversely effect the environment.

### 3.3 REAM AND PULL BACK

- A. Pre-reaming: Pre-reaming operations shall be conducted at the discretion of the horizontal directional drilling or boring CONTRACTOR. All provisions of this specification relating to simultaneous reaming and pulling back operations shall pertain to pre-reaming operations.
- B. Pulling Loads: CONTRACTOR shall be responsible for determining safe pulling loads required for proper installation. Such loads shall be minimized as required to prevent failure of the pipeline during installation.

- C. Torsional Stress: A properly sized and fully operational swivel will be installed between the reaming assembly at the end of the drill pipe, and the pipeline to restrict torsional stress from being transmitted to the pipeline.
- D. CONTRACTOR may opt to fill the pipeline with water (ballasting) as installation proceeds to help prevent buckling and reduce buoyancy. The CONTRACTOR must completely clean and dry the pipeline after installation.
- E. Pull Section Support: The pull section shall be supported as it proceeds during pull back so that it moves freely and the pipe material is not damaged.

#### 3.4 CLEANUP, REPAIRS AND RESTORATION

- A. The CONTRACTOR is responsible for leaving all areas affected by construction activities in a condition equal to or better than the condition before construction.
- B. The CONTRACTOR shall restore area around entry and exit pits as soon as work is completed. Fill to previous existing ground elevation and grade any areas where settlement occurs due to subsidence. Seed and straw as directed in Section 02920.

END OF SECTION