

## SECTION 02317

## AUGERING PIPE FOR WATER LINES

## PART 1 GENERAL

## 1.01 SECTION INCLUDES

- A. Installing water service pipe by methods of auguring.

## 1.02 UNIT PRICES

- A. Augered pipe will be measured along the axis of the pipe and shall include fittings. In the case of a branch pipe, the length of the pipe will be considered as the distance from the axis of the line to the end of the branch. The length of the pipe laid between two lines or from a line to an appurtenance will be measured between the centerlines of each.
- B. Auger pits and other excavations are incidental to the work. Trench Safety for Auger Pits and other excavations for work specifically performed for this section shall be included in Section 01526 - Trench Safety.
- C. No separate payment will be made for pavement removal and replacement (i.e., lime stabilization, crushed limestone, hot mix asphalt surface course, cement sand base, and concrete pavement, etc.) associated with augering.
- D. If open-cut construction is requested by Contractor for his convenience in areas designated for augering, and if approved in advance by the Owner's Representative, such areas shall be paid for at the Contract Unit Price for open cut construction. Payment includes necessary surface restoration and pavement repair.

## 1.03 SUBMITTALS

- A. Submit product data in accordance with requirements of all sections and provisions of these specifications.
- B. Submit product data for casing insulators for approval.
- C. Prior to commencement of work, furnish for the Owner's Representative's approval, a plan showing pit locations. Approval of this plan will not relieve Contractor from responsibility to obtain specified results.
- D. Show actual pit locations dimensioned on as-built drawings so that they can be identified in field.

#### 1.04 REGULATORY REQUIREMENTS

- A. Conform to Texas Department of Transportation for installations under state highways.
- B. Installations under railroads:
  - 1. Secure and comply with requirements of right-of-entry for crossing railroad company's easement or right-of-way from railroad companies affected. Comply with railroad permit requirements. Submit copy to the Owner's Representative.
  - 2. Use dry auger method only.
  - 3. No extra compensation for damages due to delays caused by the railroad requesting work to be done at hours which will not inconvenience the railroad.
  - 4. Maintain minimum 35-foot clearance for bore pits from centerline of tracks, unless approved by railroad company and Owner.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. Piping and Fittings: As required by Drawings.
- B. Casings: Where required by Drawings, in accordance with Section 02611 - Steel Pipe and Fittings.
- C. Insulators: Where casings are required by Drawings, casing insulator width 8 inches for pipe sizes 4 to 12 inches; 12 inches for pipe sizes 14 to 30 inches or as shown on drawings.
- D. Casing End Seals: Provide Pipeline Seal & Insulator Model C or approved equal.

### PART 3 EXECUTION

#### 3.01 GENERAL

- A. Do not exceed 100 feet for length of auger hole for PVC pipe less than 12 inches in diameter without intermediate pit, unless shown otherwise on the drawings.
- B. Do not exceed 75 feet for length of auger hole for PVC pipe 12 inches to 16 inches in diameter without intermediate pit, unless shown otherwise on the drawings.

- C. Do not exceed 40 feet for length of auger hole for PVC pipe greater than 16-inches in diameter without intermediate pit, unless shown otherwise on the drawings.

### 3.02 PREPARATION

- A. Conform to applicable provisions of Section 02100 - Right-of-Way Preparation.

### 3.03 TRAFFIC CONTROL

- A. Conform to applicable provisions of Section 01570 - Traffic Regulation and Control.
- B. Secure right-of-entry for crossing railroad company's easement or right-of-way.

### 3.04 JACKING

- A. Comply with Section 01526 - Trench Safety Systems for all pits, access shafts, end trenches and other excavations relating to work required by this specification.
- B. If grade of pipe at jacking end is below ground surface, excavate suitable pits or trenches for conducting jacking operations and for placing end joints of pipe. Wherever end trenches are cut in sides of embankment or beyond it, sheath securely and brace such work to prevent earth caving.
- C. No more than one joint shall be made-up in pit or trench prior to jacking.
- D. Construction shall not interfere with operation of railroad, street, highway, or other facility, nor weaken or damage embankment or structure.
- E. During construction operations, furnish and maintain barricades and lights to safeguard traffic and pedestrians as directed by the Owner's Representative, until such time as backfill has been completed and removed from site.
- F. Provide heavy-duty jacks suitable for forcing pipe through embankment. Use suitable jacking head, usually of timber, and suitable bracing between jacks and jacking head and suitable jacking frame or backstop so that jacking pressure will be applied to pipe uniformly around ring of pipe. Set pipe to be jacked on guides, properly braced together, to support section of pipe and to direct it in proper line and grade. Place jacking assembly in line with direction and grade of pipe. Excavate embankment material just ahead of pipe and remove material through pipe. Force pipe through embankment with jacks, into space thus provided.
- G. Conform excavation for underside of pipe to contour and grade of pipe, for at least one third of circumference of pipe. Provide clearance of not more than 2 inches for upper half of pipe. Taper off upper clearance to zero at point where excavation conforms to contour of pipe.

- H. Distance that excavation shall extend beyond end of pipe depends on character of material, but it shall not exceed 2 feet in any case. Decrease distance on instructions from the Owner's Representative, if character of material being excavated makes it desirable to keep advance excavation closer to end of pipe.
- I. Jack pipe from low or downstream end. Lateral or vertical variation in final position of pipe from line and grade established by the Owner's Representative will be permitted only to extent of 1 inch in 10 feet, provided such variation is regular and only in one direction and that final grade of flow line is in direction indicated on plans.
- J. Use cutting edge of steel plate around head end of pipe extending short distance beyond end of pipe with inside angles or lugs to keep cutting edge from slipping back onto pipe.
- K. Once jacking of pipe is begun, carry on without interruption, insofar as practicable, to prevent pipe from becoming firmly set in embankment.
- L. Remove and replace any pipe damaged in jacking operations.
- M. Backfill pits or trenches excavated to facilitate jacking operations immediately after completion of jacking of pipe.
- N. Grout annular space when loss of embankment occurs or when clearance of two inches is exceeded.

### 3.05 AUGURING (BORING)

- A. Auger from approved pit locations. Excavate for pits and install shoring as outlined above under "Jacking." Auger mechanically with use of a pilot hole entire length of crossing and check for line and grade on opposite end of bore from work pit. The large hole is to be no more than 2 inches larger than diameter of bell. Place excavated material outside working pit and dispose of as required. Use water or other fluids in connection with boring operation only to lubricate cuttings; jetting will not be permitted.
- B. In unconsolidated soil formations, a gel-forming colloidal drilling fluid may be used. Fluid is to consist of at least 10 percent of high-grade processed bentonite and shall consolidate cuttings of bit, seal walls of hole, and shall furnish lubrication for subsequent removal of cuttings and installation of pipe.
- C. Grout annular space when loss of embankment occurs or when clearance of two inches is exceeded.

### 3.06 CASING

- A. Install casings as required by Drawings, in accordance with this section.

### 3.07 INSULATOR INSTALLATION

- A. There must be no inadvertent metallic contact between casing and carrier pipe. Spacing of spacers should ensure that carrier pipe is adequately supported throughout its length, particularly at ends, to offset settling and possible electrical shorting. End spacer must be within 6 inches of end of casing pipe, regardless of size of casing and carrier pipe or type of spacer used. Casing spacers are designed to withstand much greater loads than can be safely applied to most coatings. Therefore, spacing between spacers depends largely on load bearing capabilities of pipe coating and flexibility of pipe.
- B. Bottom of trench adjacent to each end of casing should be graded to provide firm, uniform and continuous support for carrier pipe. If trench requires some backfill to establish final trench bottom grade, backfill material should be placed in 6-inch lifts and each layer properly compacted.
- C. Casing spacers should be installed in accordance with manufacturer's instructions. Special care should be taken to ensure that all subcomponents are correctly assembled and evenly tightened, and that no damage occurs during tightening of insulators or carrier pipe insertion.
- D. Annulus between carrier pipe and casing should be sealed with casing end seals at each end of casing.
- E. Insulator Spacing:
  - 1. Spacing shall be as shown on Drawing with maximum distance between spacers to be 10 feet for pipe sizes 4 to 14 inches and 6 feet for pipe sizes 16 to 30 inches.
  - 2. If casing or carrier pipe is angled, bent or dented, spacing should be reduced.

### 3.08 PITS

- A. Locate auger pits where there is minimum interference with traffic or access to property.
- B. Pit Size: Provide minimum 6-inch space between pipe and walls of bore pit. Maximum allowable width of pit shall be 5 feet unless approved by the Owner's Representative. Width of pit at surface shall not be less than at bottom. Maximum allowable length of pit shall be no more than 5 feet longer than one full joint of pipe and shall not exceed 25 feet unless approved by the Owner's Representative.

- C. Excavate bore pits to finished grade at least 6 inches lower than grade indicated by stakes or as approved by the Owner's Representative.
- D. Backfill in accordance with Section 02227.

3.09 CLEANUP

- A. Conform to applicable provisions of Section 01564 - Waste Material Disposal.

3.10 FILLING ANNULAR SPACE

- A. Allowable variation from line and grade shall be as specified under "Jacking." Block void space around pipe in augered hole with approximately 12 inches of packed clay or similar material approved by the Owner's Representative, to prevent bedding or backfill from entering the void around the pipe in the augered hole when compacted. For pipe diameters 4 inches through 8 inches use minimum 1/2 cubic foot clay for pipe diameters 12 inches through 16 inches use minimum 3/4 cubic foot clay.

END OF SECTION