SECTION 02315

PIPE AND CASING AUGERING FOR SEWERS

PART 1 G E N E R A L

1.01 SECTION INCLUDES

A. Installation of casing for sewer pipe by dry augering or slurry boring methods, together with installation of sewer pipe in the casing.

B. Installation of sewer pipe by slurry boring methods. Construction casing may be used at the Contractor's option.

1.02 UNIT PRICE

A. Casing, including sewer pipe, installed by augering methods in mid-run of open cut segments where shown on the Drawings, will be measured and paid by the linear foot from end to end of the casing. Casing may be installed, at the Contractor's option, at locations other than shown on the Drawings, at no additional cost to the Owner.

B. Sewer pipe installed by augering method in mid-run of open-cut segments where shown on the Drawings, will be measured and paid by the linear foot from end to end of the augered section.

C. Pipe or casing segments installed by augering methods in locations other than mid-run of open cut segments and shown on the Drawings, will be measured and paid by the linear foot along the centerline of the completed sewer from centerline to centerline of manholes to the ends of stubs or termination of the pipe, and to the inside face of lift stations and other structures.

D. Payment will include and be full compensation for labor, equipment, materials and supervision for excavation and construction of the sewer, complete in place including disposal of excess materials, shoring, dewatering, utility adjustments, grouting, backfill, clean-up and other related work necessary for construction as indicated on the Drawings and specified this Section.

E. Cost for pits and other excavations are included in the unit price for pipe with or without casing.

F. Trench safety systems for pits are paid as specified in Section 01526 - Trench Safety Systems.

1.03 DEFINITIONS

A. Augering means either "dry augering" or "slurry boring".

B. Dry augering is jacking a casing while excavating the soil at the heading and transporting the spoil back through the casing by an otherwise uncased auger.

C. Slurry boring is installing a casing or pipe by drilling a small diameter pilot hole, followed by reaming the bore to full diameter with the assistance of slurry or drilling fluids.

1.04 SUBMITTAL

A. Make submittals in conformance with all sections and provisions of these specifications.

B. For installation by augering, submit for review:

1. Description of mechanized excavating equipment.

2. Method of controlling line and grade.

3. Grouting techniques to be used for filling annular void between sewer pipe and casing, and void between sewer pipe or casing and the ground, including equipment, pumping and injection procedures, pressure grout types, and mixes.

4. Locations and dimensions of pits.

5. Pit design and construction drawings.

6. Identification of casings required and paid under the Contract and casings installed at the Contractor's option.

7. Design of casings.

C. Prepare auger pit and casing design submittals that are site specific. Have auger pit and casing design submittals signed and sealed by a qualified Professional Engineer registered in the State of Texas.

D. Construction phase submittals shall include:

1. Daily logs of augering and boring operations.

2. Settlement monitoring data to meet the requirements of paragraph 3.06, Settlement Monitoring.

3. Submit daily logs and settlement monitoring data within 5 days after the day of observation.

1.05 CRITERIA FOR DETERMINING CASING INSTALLATION LOADS

A. Select and design casing pipe and pipe joints to carry the thrust of jacks or loads due to the pulling mechanism in combination with overburden, earth and hydrostatic loads. Select casings for dry augering to withstand the action of the auger without damage.

B. Use Cooper E-80 locomotive loading distributions as criteria for railroad crossings in accordance with AREA's specifications for culverts. In the design, account for additive loadings due to multiple tracks.

C. Use H-20 vehicle loading distributions as criteria for truck loading in accordance with AASHTO.

D. When not specifically indicated on the Drawings, select casing diameter to permit practical installation (including skids if applicable) and grouting.

PART 2 P R O D U C T S

2.01 MATERIALS

A. Provide casing pipe which is straight, circular in section, uncoated, welded steel pipe, manufactured in accordance with AWWA C 200.

B. Provide sewer pipe in accordance with Section 02730 - Gravity Sanitary Sewers.

C. Provide restrained-joint sewer pipe when installing sewer pipe in slurry bored holes by a pull-back method.

D. Supply grout as specified in Section 02330 - Tunnel Grout.

PART 3 E X E C U T I O N

3.01 LOCATION AND SIZE OF AUGER PITS

A. Show the location of auger pits on the auger pit construction drawings. Locate auger pits for slurry boring so that the distance between pits is no greater than 80 feet; and for dry augering not more than 120 feet apart, unless shown otherwise on plans.

B. Where possible, locate auger pits and associated work areas to avoid blocking driveways and cross streets and to minimize disruption to business and commercial interests. Avoid auger pit locations near areas identified as potentially contaminated.

C. Make size adequate for construction of any structures indicated on the Drawings. Provide adequate room to meet Contractor's operational requirements for augering.

D. Provide a portable concrete traffic barrier around the periphery of the pit, meeting applicable safety standards. Properly maintain the barrier throughout the period the pit remains open. Angle traffic barriers in the direction of the lane flow; do not place barriers perpendicular to on-coming traffic

E. Provide a full cover or other security fencing for each access pit in which there is no construction activity or which is unattended by Contractor’s personnel.

3.02 DRY AUGERING OF CASING

A. Provide jacks, mounted on a frame or against a backstop, of a capacity suitable for forcing the excavating auger and casing through the soil conditions to be encountered. Operate jacks so that even pressure is applied to the casing.

B. Provide steerable front section of casing to allow vertical grade adjustments. Provide a water level or other means to allow monitoring of the grade elevation of the auger casing.

C. Bentonite slurry may be used to lubricate the casing during installation. The use of water to facilitate removal of spoil is permitted; however, water jetting for excavation of the soil is not allowed when jacking casing.

D. Tolerances from lines and grades shown on the Drawings for gravity sewer pipe installed in casing are plus or minus 6 inches in horizontal alignment, and slope shall be at least the design grade or greater if approved by the Owner.

3.03 SLURRY BORING OF CASING OR PIPE

A. Drill a small diameter pilot hole and check for line and grade at the receiving end. Redrill the pilot hole if the bored pipe does not meet specified tolerances.

B. Using the pilot hole as a guide, bore a larger diameter hole of sufficient size for pipe or casing installation. Water jetting is not permitted.

C. Bentonite slurry may be used to maintain a stable hole and furnish lubrication for pipe or casing installation.

D. Tolerances from lines and grades shown on the Drawings for the installed sewer pipe are plus or minus 6 inches in horizontal alignment and slope shall be at least the design grade or greater if approved by the Owner.

E. Completely fill the annular space between the sewer pipe and the surrounding soil or casing with grout, without displacing the pipe during the grouting operation.

3.04 SEWER PIPE IN CASING

A. Grout the annular void between sewer pipe and any casing from end to end of the casing. Block and brace the sewer pipe to prevent movement during grout placement and to maintain specified line and grade. Grout as specified in Section 02330 - Tunnel Grout.

3.05 SETTLEMENT MONITORING (IF REQUIRED)

A. Monitor the ground surface elevation along the length of the augering operation. Locate and record settlement monitoring points with respect to construction baseline and elevations. Record elevations to an accuracy of 0.01 feet for each monitoring point location. Establish monitoring points at locations and by methods that protect them from damage by construction operations, tampering, or other external influences. As a minimum, locate survey points as follows:

1. For road crossings. Centerline and each shoulder

2. Railroads. Track subbase at centerline of each track.

3. Utilities and Pipelines. Directly above and 10 feet before and after the utility or pipeline intersection.

4. Long bores under improved areas such as pavements. Ground surface elevations must be recorded on the centerline ahead of augering operations at locations not to exceed 50 feet apart (including points located for roads, railroads, utilities and pipelines), or at least three locations per augering drive.

B. Reading Frequency and Reporting. Take settlement survey readings:

1. Prior to the auger excavation reaching the point.

2. After the auger reaches the monitoring point in plan.

3. After grouting of the ground supporting pipe or casing is complete.

C. Immediately report to the Owner’s Representative any movement, cracking, or settlement which is detected.

D. Following substantial completion but prior to final completion, make a final survey of all monitoring points.

3.06 DISPOSAL OF EXCESS MATERIAL

A. Remove and dispose of spoil from the job site in accordance with Section 01564 - Waste Material Disposal.

3.07 LEAKAGE TESTING

A. Test for leakage by low pressure air methods in accordance with Section 02732 - Acceptance Testing for Sanitary Sewer.

END OF SECTION