Section 2310

Jack and Bore

PART 1: General

1.1 *General Description of Work* – This work shall consist of boring and jacking operations related to the installation of water pipe and sanitary sewer pipe, in areas where trenching is not feasible or permitted, or as designated on the plans.

PART 2: Products

2.1 *Pipe* –

2.1.1 *Requirements* – Steel casing shall be used for all installations requiring casing sizes 8- inches or larger.

2.1.1.1 The steel casing shall be seamless or electric resistance-welded tubing for sizes up to 24-inch O.D. and standard double-submerged arc-weld for sizes over 24 inches.

2.1.1.2 Steel pipe shall be new, unused, ASTM A-139, Grade B, straight seam, minimum yield strength of 35,000 psi, and minimum tensile strength of 60,000 psi, with one beveled end (to 37 degrees) and other end square cut.

2.1.1.3 The table provided on the next page represents ECUA minimum requirements. The Project Engineer shall review project specific requirements such as soil and loading conditions along with requirements of the applicable transportation authority having jurisdiction over the subject real estate to determine whether the specific project warrants heavier walled casing than the minimum depicted herein.

Casing Size Versus Carrier Size		
Carrier Pipe I.D.	**Steel Casing Diameter**	**Minimum Wall Thickness**
2”	8”	.188”
3”	10”	.188”
4"	12”	.188”
6"	14”	.188”
8"	16”	.250”
10"	18”	.250”
12"	20”	.250”
14"	24”	.250”
16"	24”	.250”
18"	30”	.312”
20"	30”	.312”
24"	36”	.312”
30"	42”	.375”
36"	48”	.500”
42"	60”	.500”
48"	72”	.625”

2.2 *Smaller Casing Sizes* – For casing sizes eight inches and smaller, install in accordance with Section 3.2; steel, PVC, or PE material may be used.

PART 3: Execution

3.1 *Requirements* –

3.1.1 Boring shall be performed to alignment and grade as shown on the construction drawings.

3.1.2 Equipment shall be of adequate size and capability to install the product and in conformance with the equipment Manufacturer’s recommendations for all power equipment used in the installation. Equipment shall have a means for controlling line and grade and a means for centering the cutting head inside the borehole. Equipment shall provide a means for preventing voids by assuring:

3.1.2.1 In stable, cohesive conditions, the rear of the cutting head must be prevented from advancing in front of the leading edge of the casing by more than 1/3 times the casing diameter, not to exceed 8 inches.

3.1.2.2 In unstable conditions, such as granular soil, loose or flowable materials, the cutting head must be retracted into the casing a distance that permits a balance between pushing pressure, pipe advancement and soil conditions.

3.1.3 Every effort shall be made to prevent formation of voids. Upon completion of the boring operations, voids around the outside face of the casing shall be filled by grouting.

3.1.4 The Contractor shall be responsible for protecting any underground utilities and for any damage resulting to located utilities.

3.1.5 The Contractor shall be fully responsible for producing a sound, tight installation, true to line and grade. All pipe shall be installed through the casing using casing spacers per the applicable ECUA Standard Detail.

3.1.6 Only workmen experienced in boring operation shall perform the work.

3.1.7 Joint restraint for pressure pipe shall be provided in accordance with Standard Detail D-65.

3.1.8 If the grade of the pipe at the jacking end is below the ground surface, suitable pits or trenches shall be excavated for the purpose of conducting the jacking operations and for placing end joints of the pipe. Such work shall be sheeted securely and braced in accordance with OSHA Trench Safety requirements.

3.1.9 Heavy duty jacks suitable for pushing the casing through the soil shall be provided. In operating jacks, even pressure shall be applied to all jacks used so that pressure will be applied to the casing uniformly around the ring of the casing.

3.1.10 A suitable jacking frame or back stop shall be provided. The pipe to be jacked shall be set on guides properly braced together, to support the section of the casing and to direct it in the proper line and grade.

3.1.11 The whole jacking assembly shall be placed so as to line up with the direction and grade of the casing. In general, soil material shall be excavated just ahead of the casing and material removed through the casing and the casing forced through the soil with jacks, into the space thus provided.

3.1.12 The casing, preferably, shall be jacked from the low or downstream end. Lateral or vertical variation in the final position of the casing from the line and grade established by the Engineer shall not exceed 0.1 feet per 50 linear feet of pipe for gravity flow installations, provided that such variation shall be regular and only in one direction and that the final grade or flow line shall be in the direction indicated.

3.1.13 If the Contractor desires, he may use a cutting edge of steel plate around the head end of the casing extending a short distance beyond the end of the casing with inside angles or lugs to keep the cutting edge from slipping onto the casing.

3.1.14 When jacking of casing is once begun, the operation shall be carried on without interruption, insofar as practical, to prevent the casing from becoming firmly set in the soil.

3.1.15 Any casing damaged in jacking operations shall be removed and replaced by the Contractor at his entire expense.

3.1.16 Immediately after jacking is complete and the carrier or encasement pipe is accurately positioned and approved for line and grade, the clearance space between the pipe and soil shall be completely filled by pressure grouting for the entire length of the installation.

3.1.17 The pits or trenches excavated to facilitate jacking operations shall be backfilled immediately after the jacking of the casing has been completed.

3.2 *Smaller Casing Sizes* – For casing or sleeve sizes eight inches or smaller, alternate casing installation methods are allowed subject to the approval of the applicable transportation authority

having jurisdiction over the subject real estate. These methods may include pneumatic mole, punching, or pushing methods.

PART 4: Measurement and Payment

4.1 *Measurement* –

4.1.1 Measurement shall be per linear foot of installed casing, and shall include furnishing all labor, materials, equipment, and work involved in the boring operations.

4.1.2 The unit measurement shall also include skids, steel ties, grouting, and other items associated with the boring and casing.

4.2 *Payment* –

4.2.1 The accepted quantities for boring and jacking will be paid at the unit bid price per linear foot of installed casing.

4.2.2 Payment for carrier pipe will be paid in accordance with Section 2556-“Water Distribution Systems” and Section 2570-“Gravity Sewer Collection Systems”.

4.2.3 When not listed as a separate Contract pay item, boring, drilling and jacking conduit or jacking shall be considered as incidental work, and the cost there of shall be included in such Contract pay item(s) as provided in the Contract proposal.

4.2.4 Compensation, whether by Contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.