

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

SPECIAL PROVISION

**P.I. No.: 0010782
District 7**

Section 615 – Jacking or Boring Pipe
(Directional Boring)

Delete Section 615 as written and substitute the following:

615.1 General Description

This work shall consist of installing various sizes of bores by directional boring through whatever materials may be encountered.

615.1.01 Definitions

General Provisions 101 through 150.

615.1.02 Related References

A. Standard Specifications

[Section 205—Roadway Excavation](#)

[Section 208—Embankments](#)

B. Referenced Documents

General Provisions 101 through 150.

615.1.03 Submittals

Furnish, for the Engineer's approval, a plan showing the proposed methods for the installation of the horizontal directional bore. The Engineer will review the proposed installation plan within 10 working days of receipt by the Department. No directional boring work will be allowed until the Contractor's submitted plan is approved by the Engineer. This plan shall include the following detail as a minimum:

- List of projects completed by the company performing the boring operation, environment of installation (urban work, river crossing, freeway), diameter of product installation and length of bores. This list of projects must include the name, address and phone number of an owner's representative with knowledge of the performance of the work. Provide at least five previously completed projects of similar scope as the boring work included in this contract.
- List of the Contractor's key personnel with a resume of boring experience. The Department will be the sole judge of the qualifications of the foreman and the drill operators.
- Location of all proposed boring entry and exit pits.

- Proposed alignment of bore both horizontal and vertical. The proposed alignment shall maintain a minimum clearance of 18 inches (450 mm) or 2 times the diameter of the final product installation, whichever is greater, at any obstruction. Boring will not be allowed in select backfill areas such as at mechanically stabilized wall locations.
- Proposed diameter of bore. This diameter is the diameter of the final product installation.
- Proposed diameter of pilot borehole.
- Proposed diameter of back reamer. In no case shall the diameter of the back reamer exceed 1.5 times the diameter of the final product installation.
- Proposed depth of cover. The depth of cover shall be equal to or greater than 10 times the diameter of the final product installation. Additionally, the minimum depth of cover allowed in paved shoulders shall be 4 feet (1.22 meters). The minimum depth of cover outside of the paved shoulder shall be 8 feet (2.44 meters).
- Evaluation of soil conditions to be encountered. Full soil survey not required. As a minimum, excavate the entrance and exit pits for the proposed bore and determine the nature of the material likely to be encountered. The drilling fluid composition should be based on the evaluation of the materials encountered in the bore pit excavation.
- Proposed composition of drilling fluid.
- Proposed drilling fluid pressure and flow rates.
- Proposed drilling fluid management plan.
- Proposed pull back rate.
- Type of tracking system.

615.2 Materials

Use conduit types and sizes that conform to the Plans and the following:

Material	Section
Electrical Wire, Cable, and Conduit	682

615.3 Construction Requirements

Suitable pits or trenches shall be excavated for the boring operation and for placing end joints or termination connectors of conduit when required. Pits or trenches shall be securely sheeted and braced where necessary to prevent caving.

Where directional boring is required under railroads, highways, streets or other facilities, construction shall be done in the manner that will not interfere with the operation of the facility, and shall not weaken the roadbed or structure. No roadway pavement, subgrade, roadbed, paved shoulder, or unpaved median shall be disturbed or excavated as part of the boring or pipe placing operation for any reason without written authorization by the Engineer. In the above areas, any broken or damaged boring rod/stem, boring head (including transmitter/transponder locating heads and cutter heads), couplings (including backreaming, swivel or connector couplings), or any other material that cannot be retrieved as part of the pullback operation shall become the property of the Department and shall be abandoned in place unless otherwise authorized in writing by the Engineer. There shall be no additional payment for abandoned material.

Continuously monitor the location and alignment of the pilot drill progress to insure compliance with the proposed installation alignment and to verify depth of the bore. Monitoring shall be accomplished by manual plotting based on location and depth readings provided by the locating/tracking system or by computer generated bore logs which map the bore path based on information provided by the locating/tracking system. Readings or plots shall be obtained on every drill rod and provided to the Engineer on a daily basis for as-builts.

Monitoring of the drilling fluids such as the pumping rate, pressures, viscosity and density during the pilot bore, back reaming, and/or pipe installation stages shall be undertaken to ensure adequate removal of soil cuttings and to ensure that the stability of the borehole is maintained. Drilling fluid pressures should not exceed that which can be supported by the

overburden (soil) pressure to prevent heaving or a hydraulic fracture of the soils. Excess drilling fluids shall be contained at the entry and exit points until recycled or removed from the site. Ensure that all drilling fluids are disposed of in a manner acceptable to the appropriate local, state and federal regulations. The Contractor's work will be immediately suspended whenever drilling fluids seep to the surface other than in the boring entrance or exit pit. The Contractor must propose a method to prevent further seepage and must remove and dispose of any drilling fluid on the surface prior to resuming the boring operation.

To minimize heaving during pullback, the pullback rate should be determined to maximize the removal of soil cuttings and minimize compaction of the ground surrounding the borehole. The pullback rate shall also minimize over cutting of the borehole during the back reaming operation to ensure that excessive voids are not created resulting in post installation settlement. Any surfaces damaged by the work shall be restored to their preconstruction conditions. All costs associated with the restoration are to be borne by the Contractor.

The distance that the excavation extends beyond the end of the bore will depend upon the character of the excavated material, but shall not exceed 2 feet (0.61 meters) in any case. This distance shall be decreased on instructions from the Engineer if the character of the material being excavated makes it desirable.

Once the directional boring is begun, the operation shall be carried on without interruption, insofar as practical.

The pits or trenches excavated to facilitate boring operations shall be backfilled immediately after the boring has been completed.

The boring shall proceed from a surface staging area provided for the boring equipment and workers. The location of the staging area shall be approved by the Engineer. The holes shall be bored mechanically. Excavated material will be placed near the top of the working pit and disposed of as required. The use of water or other fluids in connection with the boring operation will be permitted only to the extent necessary to lubricate cutting. Jetting will not be permitted.

Excavation will not be paid for separately, but all of the provisions of Section 205 and 208 shall govern.

In unconsolidated soil formations a gel-forming colloidal drilling fluid consisting of at least 10% high grade carefully processed bentonite may be used to consolidate excavated material, seal the walls of the hole, and furnish lubrication for subsequent removal of material and immediate backreaming/installation of conduit. Flow pressure on the drilling fluid shall be continuously monitored and maintained at the minimal pressure required to place the fluid. At no time shall the flow pressure exceed 500 psi (3448 k Pa) and should normally not exceed 200 psi (1379 k Pa). All drilling fluid spoils shall be completely removed from both ends of the bore and properly disposed of at a location provided by the Contractor.

Allowable variation from line and grade established by the Engineer shall be a maximum of 2 percent. Any voids which develop during the installation operation and are determined by the Engineer to be detrimental to the Work, shall be pressure grouted with an approved mix.

Directional boring operations inherently include the risk of encountering under grade obstructions that begin to alter the bore direction. Should an obstruction be encountered, the Engineer shall be notified immediately. Attempts at corrective measures to restore the proper bore alignment should include but are not limited to boring deeper or shallower (if minimum pipe depth can be maintained), moving the boring head to the right or left of the obstruction, or attempt to bore through the obstruction (if other than solid rock). To restore the bore alignment, a minimum of three attempts shall be made to the Engineer's satisfaction at each encountered obstruction with different corrective measures. If a suitable bore alignment cannot be restored, the Engineer may authorize a relocation of the bore. Unsuccessful boring attempts shall be paid in accordance with Sections 615.4 and 615.5 below, using the obstruction location as one end of the measured length of directional boring.

615.4 Measurement

No separate measurement will be made for this Item.

615.5 Payment

Payment will be made under CONSTRUCTION COMPLETE. This work performed and materials furnished by this Item shall include the bore and all incidentals necessary to complete the Item. All excavated material resulting from the directional boring operations shall be disposed of or used as directed by the Engineer at no additional cost to the Department.