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SECTION 815

PIPE BURSTING

I. GENERAL

1.1 DESCRIPTION OF WORK

The Work covered in this section specifies the method or process to include all labor, materials, tools, equipment and incidentals necessary to provide for the complete rehabilitation of deteriorated sanitary gravity sewer by pipe bursting, connect new pipe to existing manholes, modify existing manholes bases as needed, reconnect existing sewer lateral connections, perform pre- and post-rehabilitation television inspection, and other Work as shown in the Contract Documents and as specified herein..

Pipe bursting is the construction technique of replacing an existing, underground pipe system in situ by fracturing a pipe and displacing the fragments outwards into the surrounding soil while a new HDPE or fPVC pipe is drawn in to the annulus left by the expanding operation to replace the old pipe. The process can be either by pneumatic, hydraulic or static pull methods, using a conically shaped bursting head to break out the old pipe. The rear of the bursting head is connected to the new pipe, while its front is connected to a cable or pulling rod. The bursting head and the new pipe are launched from the insertion pit, and the cable or pulling rod is pulled from the reception pit. The replacement pipe is either pulled or pushed into the bore. The replacement pipe shall not be greater than 25% larger in diameter than the existing pipe. **Under favorable conditions upsizing to 150% of the existing diameter may be permitted upon submittal and Owner approval of supporting calculations from the Contractor.**

1.2 SUBMITTALS

The Contractor shall provide qualifications to the Owner as evidence of competency and authority to perform the method of pipe bursting to be utilized and restoration of existing services. The qualifications and submittals shall include the following:

A. The Contractor shall be trained by the pipe bursting equipment manufacturer in the use of the equipment for pipe bursting. The Contractor shall submit a letter from the manufacturer stating that they provided training to contractor staff on the use, operation and maintenance of the equipment. The Contractor shall hold the Owner and its agents harmless in any legal action resulting from patent infringement.

B. The Contractor shall be trained by the thermal fusion equipment manufacturer in the use of the equipment for thermal butt-fusion of high density polyethylene (HDPE) pipe. The butt-fusion method for pipe jointing shall be carried out in the field by certified operators with prior experience in fusing HDPE pipe with similar equipment using proper jigs and tools per standard procedures outlined by the pipe manufacturer. HDPE pipe shall conform to the requirements of Section 200.

C. All pipe bursting Contractors shall have at least two (2) years continuous experience in pipe bursting and shall have completed at least three projects in the last five (5) years involving pipe bursting installations of a combined total of 25,000 feet of pipe bursting experience as a prequalification for this project. Documentation to substantiate the Contractor's experience shall be provided.

2. The insertion pit must be large enough to allow the pipe to be inserted without overstressing the new pipe in bending. Pipe manufacturer's bending radius limitations must be adhered to.

3. When the winch and pulling cables are used to pull the bursting tool through the pipe, place the winch into the reception pit and pull the cable through the existing pipe and attach to the front of the bursting unit in the insertion pit.

4. When rigid pulling rods are ~~use~~**used**, the rods shall ~~be~~ ~~threaded~~ **extend** from the reception pit through the existing pipe to the pipe insertion pit and attach to the bursting head.

C. Bursting Operation

1. The upsizing method shall not cause excessive disruption or heaving to the above ground terrain or improvements except for at the launching and receiving pits.

2. Upon commencement of the bursting process, pipe insertion shall be continuous and without interruption from one entry point to another, except as approved by the Owner.

3. Bursting head shall be remotely controlled. The bursting head shall be sized such that the maximum diameter of the temporary void created by the bursting operation shall not exceed the maximum outside diameter of the replacement pipe by greater than 20%. The new sewer shall be installed straight along the centerline of the existing pipeline following the same line and grade.

4. Due to the presence of existing utilities adjacent to the sewer to be replaced, the pipe bursting method shall limit vibrations transmitted to the surrounding soils. The peak velocity shall be limited to 0.5-inches per second.

5. In the event a section of pipe is damaged during the bursting operation, or joint failure occurs, as evidenced by inspection, visible groundwater inflow, or other observations, the Contractor shall submit to the Owner for approval his methods for repair or replacement of the pipe.

6. Winch and Cable Method

   a. Bursting of the old pipe shall be performed as a continuous action providing constant tension to the bursting head when the winch and cable method is used.

   b. The Contractor shall provide a system of guide pulleys and bracing at the exit pit to minimize cable contact with the existing pipeline between the insertion and reception pits.

   c. Trench shoring supports in the insertion pits shall remain completely separate from the winch boom support system and shall be designed that neither the winch support cable shall be in contact with therm.

7. Rigid Rod Method

When rigid rods are used as a pulling unit, the bursting operation may be temporarily halted to unthread and remove each rod section from the pit.

8. Continue this process until the bursting head is pulled completely back into the reception pit.

9. Do not drag the replacement pipe over the ground surface. Pipe shall move over rollers or slings for insertion and transportation. Pipe ends shall be capped.

10. If any obstruction is encountered that can not be burst through, the Contractor shall immediately excavate the location of the obstruction to allow the bursting to continue with the Owner's approval. This Work shall be performed in accordance with Section 818 – Point Repair by Excavation.

11. If the Contractor damages any existing utility, the Contractor shall immediately inform the utility owner of the location and the nature of the damage. The Contractor shall allow the utility owner time to conduct the necessary repairs prior to continuing the bursting operation. Damages to properly marked utilities will be the financial responsibility of the Contractor.

12. If surface heave or subsidence occurs, the Contractor shall repair the impacted area(s) to the satisfaction of VDOT or the locality, as appropriate.

D. Sewer Service Laterals and Reconnections

1. The Contractor shall be responsible for continuity of sanitary sewer service to each customer connected to the section of sewer being replaced or rehabilitated during the execution of the work. If sewage backup occurs and enters buildings, the Contractor shall be fully responsible for clean-up, repair, property damage costs and claims.

2. Existing service connections shall be located before initiating sewer main replacement operations. Service laterals shall not be reconnected to the new sewer line until replacement and testing are completed, and not less than 4 hours after completion of the pipe bursting procedure. If the bursting is done with HDPE pipe, there shall be a minimum 12- hour relaxation period before permanent lateral reconnection~~.~~**, in accordance with the manufacturer's written recommendations. A strain gage shall be used to verify that pipe strain does not exceed the manufacturer's recommendations, unless deemed unnecessary by the Owner.** Any services remaining off line for an extended period of time, or any connections as deemed necessary by the Owner to protect the customer, shall be bypass pumped until such time that they can be reconnected.

3. Connection of the new service lateral (ASTM D-3034 SDR 26 PVC Pipe) to the new sewer main shall be accomplished by use of the watertight compression –fit service connection. The service connection shall be specifically designed for connection to the fPVC or HDPE sewer main being installed, and shall be INSERTA TEE as manufactured by Insert Tee Fittings, Inc., or approved equal.

2.3 SEALING AND BENCHES IN MANHOLES

A. Following the minimum relaxation period identified above, the annular space in the manhole wall