

STATIC PIPE BURSTING SPECIFICATION

SEWER AND WATER REPLACEMENT

1.0 GENERAL

This section contains guidelines and specifications applicable to the installation of pipelines using pipe bursting. It includes minimum requirements for design, materials and equipment used in the pipe bursting process for trenchless construction of pipelines.

1.1 DESCRIPTION

This section addresses the procedures to be employed for pipe bursting existing water/sewer pipelines, as identified on the drawings, and replacing with new ductile iron pipe.

1.2 QUALIFICATIONS

1.2.1 The contractor shall be trained by the respective manufacturer of the pipe bursting equipment in the use of that machinery. The contractor shall provide certification from the manufacturer that the contractor has been trained and is proficient in the use of the equipment. Only the contractor's employees trained and certified by the manufacturer shall be allowed to operate the equipment during the project.

1.2.3 The contractor must have successfully completed 3,000 feet of pipe bursting which includes one successful static pipe bursting project. Contractor shall submit a list of these projects including the owner, engineer, addresses, phone numbers and dates that said projects were completed with their proposal.

1.3 METHODS

The method approved for rehabilitation of existing sanitary sewers by pipe bursting and installation of new ductile iron pipe is TT Technologies, Inc. GRUNDOBURST system, or approved equal. Bursting rods shall be pushed from a pit through the existing pipe to a pipe pit where the bursting appurtenances and pipe are connected and pulled back through the existing pipe.

1.4 EQUIPMENT

1.4.1 Pipe bursting tool shall be static. The bursting action of the tool shall increase the external dimensions sufficiently, causing breakage of the pipe at the same time expanding the surrounding ground. This action shall not only break the pipe, but also create the void into which the expander head can be statically pulled which enables forward progress to be made. Simultaneously, the new flexible restrained joint ductile iron pipe (US Pipe - TR FLEX) either directly attached to the expander or connected via a ductile iron pipe pulling head of similar joint design, shall also move forward.

1.4.2 The static pulling frame shall be telescopic in design to allow the cutting head to release at the termination of the pull. This also provides minimal trench length by telescopic adjustment.

1.4.3 Quick lock bursting rods are required to guarantee snap lock connections. Quick Lock rods also stabilize cutting wheels at a 90° plane to invert pipe. Threaded bursting rods are not allowed. This insures the same cutting location eliminating threaded rod failures and turning of rods which effect cutting ability of blades.

STATIC PIPE BURSTING SPECIFICATION

SEWER AND WATER REPLACEMENT

1.4.4 The unit must maintain automatic thrust and pull back.

1.4.5 The static unit is capable of pipe bursting in two directions from the same excavation.

1.5 SUBMITTALS

1.5.1 Submit manufacturer's specific technical data with information and pipe dimensions pertinent to this job if required by the engineer. A certificate of "Compliance with Specification" or suitable alternative shall be furnished for all materials to be supplied.

1.5.2 Detail drawings and written descriptions of the entire construction procedure to install pipe, bypass sewage flow, pit sizes, pit construction and shoring, dewatering and sewer service reconnections.

2.0 MATERIALS

2.1.1 Pipe shall meet the requirements of ANSI/AWWA C150/A21.50 and AWWA/ANSI C151/A21.51, respectively. Pipe used for pipe bursting shall be Class 350 ductile iron pipe with a nominal lay length of 18-ft., or as specified by the engineer, with pipe manufacturer designed restrained flexible joints and smoothly contoured bells. Joints with bulky glands or flanges shall not be acceptable. Pipe shall be US Pipe TR FLEX or approved equal. Ductile Iron Fittings for tie-in shall meet the requirements of ANSI/AWWA C153.A21.53 and/or ANSI/AWWA C110.A21.10. Fittings shall not be used during the bursting process.

2.2.2 Joint Assembly – Joint Assembly shall be in accordance with the manufacturer's recommended assembly procedure.

2.2.3 Linings – Linings shall be as follows or as otherwise specified.

Water Service – Pipe for water service shall be cement lined in accordance with ANSI/AWWA C104/A21.4.

Sewer Service (Domestic) – Pipe for domestic waste water service shall be cement lined in accordance with ANSI/AWWA C104/A21.4.

For aggressive sewer lines (where the sewer has a potential for acid formation and a pH below 6), pipe shall be lined with Protecto 401.

3.0 EXECUTION

3.1 SAFETY

The contractor shall carry out operations in strict accordance with all applicable OSHA Standards. Particular attention is drawn to those safety requirements involving work entry into confined spaces. It shall be the contractor's responsibility to familiarize and its employees with OSHA Standards and regulations pertaining to all aspects of the work.

3.2 INSERTION AND RECEIVING EXCAVATIONS

STATIC PIPE BURSTING SPECIFICATION

SEWER AND WATER REPLACEMENT

- 3.2.1 The location and number of insertion and receiving excavations shall be planned by the contractor and submitted in writing for approval by the Engineer 10 days (or as determined by the Engineer) prior to excavation. If it is determined that the construction site access is limited or restrictions on street and lane blockage is restricted or prohibited, consideration should be given to using sectional ductile iron pipe installed using the “cartridge” method.**
- 3.2.2 Before any excavation, it will be the responsibility of the contractor to check with the various utility companies and determine the location of existing utilities in the vicinity of the work area. The contractor at no cost to the City, if required, will arrange temporary construction easement and/or right-of-way areas.**
- 3.2.3 Damage to utilities and the resulting repair, temporary service cost, etc., shall be borne by the contractor. Access pits shall be backfilled in accordance with the appropriate specifications.**
- 3.2.4 All excavations shall be properly sheeted/shored in accordance with relevant specifications for trench safety systems. Any damage resulting from improperly shored excavations shall be corrected to the satisfaction of the Engineer with no compensation due to the contractor.**
- 3.2.5 All open excavations shall be kept secure at all times by the use of barricades with appropriate lights and signs, construction tape, covering with steel plates, etc., or as directed by the Engineer.**
- 3.2.6 One or more receiving pits shall be excavated at the end(s) of the sewer pipe to be replaced or at appropriate points within the length of the existing pipe. Pit shall be centered over the existing pipe.**
- 3.2.7 The number of pits for machine and pipe insertion shall be the minimum necessary to most efficiently accomplish the work. The contractor shall give consideration to the use of excavation required for other purposes such as for sanitary sewer service reconnections and manhole replacement.**
- 3.2.8 Where manholes are used as machine or new pipe insertion pits, the contractor shall identify such manholes and replace them at no additional cost to the City if damaged. Any manhole modification or replacement required shall be considered incidental to the installation of the new pipe.**
- 3.2.9 The cost of diversion pumping around a manhole or insertion pit, if required, from a manhole upstream to a manhole downstream, shall be incidental to the installation of the new pipe.**

4.0 MEASUREMENT AND PAYMENT

- 4.1.1 Payment for the work in this section will lump sum or as stipulated in the contract documents. The price for replacing the sewer pipes by pipe bursting shall be full compensation for all materials, labor, equipment, cost of insertions and retrieval pits, machine pits, pavement removal and replacement, testing, and incidentals required to complete the replacement process.**

STATIC PIPE BURSTING SPECIFICATION

SEWER AND WATER REPLACEMENT

5.0 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- 5.1 The following standards contain provisions that, through reference in this text, constitute provisions of these guidelines. All standards are subject to revision, and users of these guidelines are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.**
- 5.2 American National Standards Institute (ANSI)/American Water Works Association (AWWA)**
- 5.2.1 C150/A21.50 – Standard for the Thickness Design of Ductile-Iron Pipe**
 - 5.2.2 C151/A21.51 – Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water**
 - 5.2.3 C111/A21.11 – Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.**
 - 5.2.4 C104/A21.4 – Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.**
 - 5.2.5 C105-A21.5 – Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems**
 - 5.2.6 C110/A21.53 – Standard for Ductile-Iron Compact Fittings, 3-inch through 24-inch and 54-inch through 64-inch, for Water Service.**
 - 5.2.7 C600 – Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances**