

A.) GENERAL**DESCRIPTION:**

This specification shall cover the rehabilitation of existing sanitary sewers laterals from property line / private property to maintenance services wye, using the Static Pipe Bursting method.. Pipe bursting is a system in which the static bursting head splits the existing pipe while simultaneously installing a new Polyethylene Pipe of the same size or larger size pipe where the old pipe existed, then reconnect existing sewer service house connections, television inspection of the Polyethylene Pipe and complete the installation in accordance with the contract documents. The bursting head tool must be used in conjunction with a hydraulic power pack. Bursting head diameter depends on the diameter of the pipe to be replaced.

B.) QUALIFICATIONS:

- 1.) The contractor shall be trained by the particular Pipe Bursting System Manufacturer that such a company is a fully trained user of the pipe bursting system.
- 2.) Polyethylene pipe jointing shall be performed by personnel trained in the use of butt-fusion equipment and recommended methods for new pipe connections. Personnel directly involved with installing the new pipe shall receive training in the proper methods for handling and installing the polyethylene pipe. Training shall be performed by qualified representative.
- 3.) The Contractor shall hold the City and Engineering Firm harmless in any legal action resulting from patent infringements.

C.) SUBMITTALS:

Submit the following:

- 1.) Method of construction and restoration of existing sewer service connections. This shall include:
 - a.) Written descriptions of the size and number of access holes in street, length of pipe section being replaced, construction procedure (pipe bursting) used to install pipe, type of fitting for reconnection of sewer service connection, as required by city engineer.
- 2.) Certification of workmen training for installing pipe.
- 3.) Television inspection reports and videotapes made after new pipe installation.

D.) DELIVERY, STORAGE, AND HANDLING:

- 1.) Transport, handle, and store pipe and fittings as recommended by manufacturer.
- 2.) If new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturer or replaced as required by the Engineer at the Contractor's expense, before proceeding further.
- 3.) Deliver, store and handle other materials as required to prevent damage.

E.) METHODS FOR NEW PIPE INSTALLATION:

The method approved for rehabilitation of existing sanitary sewers by pipe bursting and installation of new polyethylene pipe is TT Technologies, Inc. GRUNDOTUGGER SYSTEM, (800-533-2078) or approved equal.

F.) MATERIALS:

Polyethylene Plastic Pipe shall be high density polyethylene pipe and meet the applicable requirements of ASTM F714 Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter, ASTM D1248, ASTM D3350. Polyethylene pipe is the optimum material for pipe bursting installations, other pipe material can be considered but the pipe bursting equipment manufacturer shall be consulted for feasibility of utilizing alternative pipe materials.

- 1.) Size of the new pipe to be used shall be to renew the sewer to its original pipe size or increase pipe size.
- 2.) All pipe shall be made of virgin material. No rework except that obtained from the manufacturer's own production of the same formulation shall be used.
- 3.) The pipe shall be homogenous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.
- 4.) Dimension Ratios: The minimum wall thickness of the polyethylene pipe, for pipe bursting installations, shall be SDR 17.
- 5.) Material color shall be white, black or whatever is specified with interior of pipe having a light reflective color to allow easier/better viewing for television inspection.

F.1) TESTS:

Tests for compliance with this specification shall be made as specific herein and in accordance with the applicable ASTM Specification. A certificate with this specification shall be furnished, upon request, by the manufacturer for all material furnished under this specification. Polyethylene plastic pipe and fittings may be rejected if it fails to meet any requirements of this specification.

G.) EQUIPMENT:

The pipe bursting tool shall be designed and manufactured to force its way through existing pipe materials by fragmenting the pipe and compressing the old pipe sections into the surrounding soil as it progresses. The bursting unit shall generate sufficient force to burst and compact the existing pipe line.

The pipe bursting tool shall be pulled through the sewer by a pulling unit located at the receiving excavation or manhole. The bursting unit shall pull the polyethylene pipe with it as it moves forward. The pipe bursting unit shall be remotely controlled. At no time will personnel be allowed in excavations during pipe bursting operations.

The bursting action of the tool shall increase the external dimensions sufficiently, causing breakage of the pipe at the same time expanding the surrounding soil. To reduce pipe drag the expander for 4" pipe shall be 5.875" O.D. and expander for 6" pipe shall be 8.00" O.D. Expanders shall be equipped with two steel alloy cutting blades, permanently mounted to the sloped surface of the expander. This action shall fracture the existing pipe and allow bursting tool to make forward progress. At the same time the new polyethylene pipe, directly attached to the sleeve on the rear of the burster, shall also move forward.

The pulling unit shall be equipped with a cable gripping system that does not leave indentations in the pulling cable. The pulling unit will be equipped with a single hydraulic cylinder that actuates the pulling grip. Pulling units that pull chain, are not allowed. Pulling units with more than one hydraulic cylinder will not be allowed.

H.) SEWER SERVICE CONNECTIONS:

Sewer service connections shall be connected to the new pipe by various methods. .

- 1.) Connection types: Inserta "T" electro-fusion, PVC Saddle.
- 2.) Access pits (typical) pipe entrance and equipment termination pit. Pit size 3' x 4' to invert depth.

PREPARATION

The contractor will conduct pipe line location on all utility lines to insure no damage resulting to the utilities during pipe bursting. If after the utility lines are located, the contractor will pot hole to verify location of utility, if the pipe bursting will encroach with in ten inches of the utility line. This is to insure no damage has been done to utility line.

I.) TELEVISION INSPECTION:

Television inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles and service connections by closed circuit television. Television inspection shall include the following:

- 1.) Videotapes (post) to be submitted to the city, as required.
- 2.) Videotapes to remain property of the city; Contractor to retain second copy for his use.
- 3.) Should any portion of the inspection tapes be of inadequate quality or coverage, as determined by the City the Contractor will have the portion re-inspected and video taped at no additional expense to the City.

J.) CONSTRUCTION METHOD:

- 1.) Equipment used to perform the work shall be located away from buildings to minimize noise impact. Provide a silent engine compartment with the winch to reduce machine noise as required to meet local requirements.
- 2.) The method approved for rehabilitation of existing sanitary sewers by pipe bursting and installation of new polyethylene pipe is TT Technologies, Inc. GRUNDOBURST system, (800) 533-2078) or approved equal. The contractor shall be licensed to use the required technology proposed for this work. Bids, submitted by unlicensed or inexperienced contractors, will be non-responsive and not allowed.
- 3.) Launching and Receiving pits shall be placed at each end of the sewer lateral service to be replaced. Other excavations may be necessary to accommodate changes of direction in the lateral service or to expose other utilities that may be in close proximity to the pipe bursting operation.
- 4.) After completion of pipe bursting installation all excavations shall be backfilled, compacted and all surfaces (hardscape and landscape) restored.

K.) FIELD TESTING:

- 1.) The existing sewer lateral is completely replaced, internally inspect with television camera and videotape as required. .
- 2.) Defects which may affect the integrity or strength of the pipe in the opinion of the Engineer shall be repaired or the pipe replaced at the Contractor's expense.

L.) PIPE JOINING:

- 1.) The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted.

All equipment and procedures used shall be used in strict compliance with the manufacturer's recommendations. Fusion Welding of the new pipe shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment.

2.) The butt-fused joint shall be true alignment and shall have uniform roll-back beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. All joints shall be subject to acceptance by the engineer and/or his representative prior to insertion.

All defective joints shall be cut out and replaced at no cost to the City. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the Engineer and/or his representative shall be discarded and not used.