

SPECIFICATIONS - DETAILED PROVISIONS
Section 15385 - Pipe Bursting

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**SECTION 15385
PIPE BURSTING**

PART 1 - GENERAL

1.01 REQUIREMENT

Under this specification, the Contractor shall be required to furnish and install within the time specified in the Contract Documents, the replacement pipe, materials and fittings as specified on the Bidding sheets, shown on the Contract Drawings, and described in these specifications, except as otherwise approved in writing by the EMWD.

1.02 GUARANTEE

The Contractor shall guarantee all materials and workmanship of items furnished under these specifications to be free from defects for a period of two (2) years after final completion and acceptance of the entire contract work. The Contractor shall, at his own expense, repair or replace all defective materials or workmanship installed by him found to be deficient with respect to any provisions of this specification.

1.03 DESCRIPTION

Pipe bursting is a system by which the bursting unit 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 and television inspection of the polyethylene pipe. The method approved for rehabilitation of existing sanitary sewers by pipe bursting and installation of new polyethylene pipe is Vermeer HAMMERHEAD MOLE PIPE BURSTING SYSTEM, or T.T. Technologies GRUNDOCRACK SYSTEMS. Only pneumatically operated equipment with a pipe bursting head attached to the polyethylene pipe will be allowed for use. The pneumatic tool must be used in conjunction with a constant tension hydrostatic winch. Contractor shall size the winch based on the diameter of the pipe to be replaced. In no case shall the constant tension on the winch exceed 20 tons.

1.04 QUALIFICATIONS

The Contractor shall submit to the District at the time of submitting the bid, certification by the particular pipe bursting system manufacturer that such company is fully trained in the use of the pipe bursting system.

Polyethylene pipe jointing shall be performed by personnel trained and certified by the pipe manufacturer 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.

The contractor shall hold harmless Eastern Municipal Water District, the design engineering firm or any permit agencies in any legal action resulting from patent infringements.

1.05 SUBMITTALS

Submit the following information:

- A. Shop drawings, catalog data, and manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. Include manufacturer's recommendations for handling, storage, and repair of pipe and fittings damaged.
- B. Method of construction and restoration of existing sewer service connections. This shall include detail drawings and written descriptions of the entire construction procedure to install pipe, bypass sewage flow and reconnection of sewer service connections.
- C. Certification of workmen training for installing pipe by pipe manufacturer.
- D. Television inspection reports and video tapes made after new pipe installation.

1.06 MEASUREMENT AND PAYMENT

Payment for quantities of pipe bursting will be made at the unit prices /or lump sum as stated on the Bidding Sheets.

Video inspection of final installed pipe shall be paid based on the cost per linear feet to TV the entire length of new pipe.

The cost of any necessary by-pass pumping shall be considered subsidiary to the cost of pipe installation and shall not be a separate pay item.

PART 2 - PRODUCTS AND MATERIALS

2.01 PIPE BURSTING

The method approved for rehabilitation of the existing sanitary sewers by pipe bursting and installation of new polyethylene pipe is the Vermeer HAMMERHEAD MOLE PIPE BURSTING SYSTEM or T.T. Technologies GRUNDOCRACK SYSTEMS.

2.02 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 D3550.

Sizes of the insertions to be used shall be such to renew the sewer to its original or greater flow capacity as detailed in plans and specifications.

The pipe shall be homogenous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

Dimension Ratios: The minimum wall thickness of the polyethylene pipe shall be a Minimum SDR 17.

2.03 DELIVERY, STORAGE AND HANDLING

Transport, handle and store pipe and fittings as recommended by manufacturer.

If new pipe and fittings become damaged before or during installation, it shall be repaired by the manufacturer or replaced as required by the District at the contractor's expense, before proceeding further.

Deliver, store and handle other materials as required to prevent damage.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHOD

Equipment used to perform the work shall be located away from buildings so as not to create noise impact. Provide a silent engine compartment with the winch to reduce machine noise as required to meet local requirements.

The contractor shall install all pulleys, rollers, bumpers, alignment control devices and other equipment required to protect existing manholes, and to protect the pipe from damage during installation. Lubrication may be used as recommended by the manufacturer. Under no circumstances shall the pipe be stressed beyond its elastic limit. Winch line shall be centered in pipe to be burst with adjustable boom.

The installed pipe shall be allowed the manufacturer's recommended amount of time, but not less than four (4) hours, for cooling and relaxation due to tensile stressing prior to any reconnection of service lines, sealing of the annulus or backfilling of the insertion pit. Sufficient excess length of new pipe, but not less than four inches, shall be allowed to protrude into the manhole to provide for occurrence. Restraint of pipe ends shall be achieved by means of Central Plastics Electrofusion couplings (800) 654-3872, or approved equal. The Electrofusion couplings shall be slipped over pipe ends against manhole wall and fused in place. Installation of Electrofusion couplings shall be done in accordance with the manufacturers recommended procedures.

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Following the relaxation period, the annular space may be sealed. Sealing shall be made with material approved by the District and shall extend a minimum of eight inches into the manhole wall in such a manner as to form a smooth, uniform, watertight joint. The terminating pipe ends in manholes shall be connected by Central Plastics Electrofusion couplings, or approved equal, to eliminate ground water infiltration. Installations of Electrofusion couplings shall be done in accordance with the manufacturer's recommended procedures.

3.02 PIPE JOINING

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. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/ or fusing equipment.

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 District prior to insertion. All defective joints shall be cut out and replaced at no cost to EMWD. Any section of the pipe with a gash, blister, abrasion, nick, scar or other deleterious fault greater in depth than ten percent 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 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 District shall be discarded and not used.

Terminal sections of pipe that are joined within the insertion pit shall be connected with Central Plastics Electrofusion Couplings or connectors with tensile strength equivalent to that of the pipe being joined.

3.03 FIELD TESTING.

After the existing sewer is completely replaced, internally inspect with television camera and video tape as required. The finished tape shall be continuous over the entire length of the sewer between two manholes to be free from visual defects. The data date and footage odometer shall be on video tape.

Defects which may affect the integrity or strength of the pipe in the opinion of the District shall be repaired or the pipe replaced at the contractor's expense.

3.04 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 in accordance with the requirements of this specification.

3.05 EQUIPMENT

The pipe bursting tool shall be designed and manufactured to force its way through existing pipe material by fragmenting the pipe and compressing the old pipe sections into the surrounding soil as it progresses. The bursting unit shall be pneumatic and shall generate sufficient force to burst and compact the existing pipeline. The bursting tool shall be selected in accordance with the manufacturer's recommendations to meet the project specific requirements for the type and size of pipe being burst and upsized if specified.

The pipe bursting tool shall be pulled through the sewer by a winch located at the upstream manhole. The bursting unit shall pull the polyethylene pipe with it as it moves forward.

The pipe bursting tool shall be pneumatic. 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 burster can be winched enabling forward progress. At the same time the polyethylene pipe, directly attached to the bursting head, shall also move forward.

The burster shall provide its own forward momentum while being assisted by winching. A hydrostatic winch shall give the burster friction by which it can be moved forward. To form a complete operating system, the burster must be matched to a constant tension hydrostatic winching system.

3.06 WINCH UNIT

A winch shall be attached to the front of the bursting unit. The winch shall provide a constant tension to the burster in order that it may operate in an efficient manner. The winch shall ensure directional stability in keeping the unit on line and grade.

The winch shall be hydrostatically operated and automatically provide a constant tension throughout the operation. The winch shall be of the constant tension type and shall be fitted with a direct reading load gauge to measure the winching load.

The constant tension winch shall supply sufficient cable in one continuous length so that the pull may be continuous between approved winching points.

The winch cable and cable drum must be provided with safety cage and supports so that it may be operated safely without injury to persons or property.

The contractor shall provide a system of guide pulleys and bracing at each manhole to minimize cable contact with the existing sewer between manholes.

The supports to the trench shoring in the insertion pit shall remain completely separate from the winch boom support system and shall be so designed that neither the pipe nor the winch cable shall be in contact with them.

3.07 SEWER SERVICE CONNECTIONS

All sewer service connections shall be identified and located prior to the pipe insertion to expedite reconnection. Upon commencement, pipe insertion shall be continuous and without interruption from one manhole to another, except as approved by the District.

Sewer service connections shall be connected to the new pipe in accordance with the manufacturer's recommendations. The saddles shall be made of a material compatible with that of the pipe. Fusion of saddle connection to the main is the only means of assuring complete leak free joint is obtained.

Electrofusion saddles as manufactured by Central Plastics, or approved equal, or conventional fusion saddles as manufactured by Central Plastics, Phillips Driscopipe, or Plexco, or approved equal shall be used.

Connection of the new service lateral* to the mainline shall be accomplished by means of a compression-fit service connection. The service connection shall be specifically designed for connection to the sewer main being installed, and shall be INSERT TEE as manufactured by Fowler Manufacturing Co., Hillsboro, Oregon (503)357-2110; or approved equal. Install using procedures and equipment as referenced in manufacturer's written installation instructions.

***TYPES AVAILABLE FOR ALL MAINLINES:**

Types	Gasketed Bell SDR 35	Gasketed Bell IPS/SCH 40
PVC Hub	ASTM D3034 SDR 35	ASTM D3034 SDR 26
Rubber Boot	ASTM C443	ASTM C443
Band	316 SS	316 SS
Screw	316 SS	316 SS
Housing	316 SS	316 SS
Gasket	ASTM F477	ASTM F477

3.08 BY-PASSING SEWAGE

By-passing pumping: The contractor, when and where required, shall provide diversion for the pipe bursting/replacement process. The pumps and by-pass lines shall be of adequate capacity and size to handle all flows. All costs for by-pass pumping, required during installation of the pipe shall be subsidiary to the pipe reconstruction item.

The contractor shall be responsible for continuity of sanitary sewer service to each facility connected to the section of sewer during the execution of the work.

If sewage backup occurs and enters buildings, the contractor shall be responsible for clean-up, repair, property damage cost and claims.

The contractor shall hold harmless Eastern Municipal Water District, the design engineering firm or any permit agencies in any legal action resulting from sewage backup.

3.09 TELEVISION INSPECTION

Contractor must provide closed circuit television inspection (CCTV) as a post-construction method to determine if the pipeline has been installed as required and all joints have been properly finished. CCTV system shall have a rotating lens camera with articulating head. Each joint will be scanned 360 degrees. The camera shall be operative in 100% humidity conditions. Lighting for the camera shall minimize relative glare. Lighting and camera quality shall be suitable to provide a clear, in focus picture of the entire periphery of the pipe for all conditions encountered during the work. Focal distance shall be adjustable through a range from 3" to infinity. The remote reading footage counter shall be accurate to one percent (1%) over the length of the particular section being inspected. The camera, television monitor and other components of the color video system shall be capable of producing a minimum of 350 line resolution. Documentation consisting of a color video tape and a written report detailing the condition of the mainline and joints shall be submitted to EMWD for approval prior to final payment.

END OF SECTION 15385

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