

**A.) GENERAL****DESCRIPTION:**

*This specification shall cover the trenchless installation of new sanitary sewer laterals from property line / private property to install a new service, using pneumatic powered boring tools. The GRUNDOMAT Piercing Tool is a pneumatic powered boring system that bores a hole through native ground while simultaneously installing a new pipe in the bore hole. The new pipe is connected to the building sewer service, television (CCTV) inspection of the new pipe, and completion of the installation in accordance with local ordinance and contract documents.*

**QUALIFICATIONS:**

- 1.) The contractor shall be trained and certified by the particular pneumatic boring method system manufacturer that such a company is a fully trained user of the pneumatic boring method 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 a qualified representative. Other pipe materials shall require similar joining and handling training.

**C.) SUBMITTALS:**

Submit the following:

- 1.) Written descriptions of the location, size and number of excavations needed, length of pipe section being installed, construction procedure used to install pipe, type of fittings for connection of sewer service, as required by the Engineer.
- 2.) Certification of workmen training for installing pipe.
- 3.) Television inspection reports and video tapes 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 installation of new sanitary sewers by pneumatic boring and installation of new polyethylene pipe is TT Technologies, Inc. GRUNDOMAT BORING SYSTEMS,(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.*

- 1.) Sizes of the insertions to be used shall be such to renew the sewer to its original 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 shall meet the following:

Depth of Cover (Feet)	Minimum SDR of Pipe
0 - 16.0	
> 16.1	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.) BORING EQUIPMENT:**

*The GRUNDOMAT boring tools shall be designed and manufactured to force its way through existing ground by compressing the surrounding soil as it progresses. The unit shall generate sufficient force to compact the existing soil. See manufacturers specifications for size of tool to be used for specific diameter pipe. Soil conditions shall be taken into account when determining tool size.*

*The reciprocating stepped-cone chisel head with chisel spring action of the GRUNDOMAT tool is unique because it hammers away at solid obstacles. This two-stroke action means that the piston's impact is concentrated on the reciprocating tool head for optimum boring performance and accuracy. Only piercing tools equipped with reciprocating stepped chisel head and pre-tensioned spring are allowed.*

*Compressed air repeatedly propels the piston against the rear of the chisel head assembly. This first compresses the pre-tensioned steel spring which forces the chisel head assembly forward independently of the main casing to overcome the high initial ground resistance. Then, the same continuous force thrusts the outer casing ahead. At the same time the new polyethylene pipe, directly attached to the sleeve on the rear of the GRUNDOMAT, shall also move forward.*

*Launching Cradle and Aiming Scope shall be used to provide accurate bore alignment and grade. Electronic measuring equipment or other accurate measuring devices are used to verify the final alignment.*

### **H.) SEWER SERVICE CONNECTIONS:**

Sewer service connections shall be connected to the new pipe by suitable methods that meet local requirements.

- 1.) Typical excavations include a pit at the intersection of the sewer main and the new lateral and a second excavation at the property line or adjacent to the building to be connected. Excavations normally include a launching pit and a receiving pit. These excavation will vary in length and depth according to the depth of the pipe, the size of the boring tool to be used, and the size and type of new pipe.

**2.) PREPARATION**

To prevent damage to adjacent facilities, all utilities shall be located and verified according to local regulations prior to boring. All potentially interfering utilities shall be exposed prior to boring. This will insure no damage has been done to other utility lines.

**I.) CONSTRUCTION METHOD:**

- 1.) 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.

**J.) FIELD TESTING:**

- 1.) The newly installed line shall be internally inspected with television camera (CCTV) and a copy of the video tape provided to the Engineer as required.
- 2.) Defects that may appear in the video inspection could effect the integrity or strength of the pipe. The engineer shall determine pipe areas to be repaired or replaced.

**K.) 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 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.

**RECOMMENDED INSPECTION INTERVALS**

- 1.) First inspection at the time of the exposure of the sewer lateral in the street.
- 2.) Observation of the butt-fusion welding process.
- 3.) After the new pipe has been installed and hooked up to the existing sewer lateral.
- 4.) Observe the backfill, compaction process and final paving.