

## **SECTION 3610 - PVC SEWER PIPE INSTALLATION**

### **PART 1 - GENERAL**

#### **1.1 SCOPE OF WORK:**

Provide all labor, materials, equipment and services required for installing PVC sewer pipe and appurtenances.

#### **1.2 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Trench Excavation for Gravity Sewers: Section 3720
- B. Bedding and Backfill for Gravity Sewers: Section 3730
- C. Gravity Sewer Leakage Tests: Section 3810
- D. Gravity Sewer Deflection Tests: Section 3820

### **PART 2 - EXECUTION - INSTALLING PVC PIPE:**

- A. All pipe shall be inspected upon arrival. If any portion of a shipment is found to be defective in diameter or thickness, or found to be contaminated with fuel exhaust or any hydrocarbon material, the entire shipment shall be rejected and removed from the Project at no cost to the OWNER. Each section of pipe shall again be thoroughly inspected immediately prior to lowering it into the trench to insure that the interior is clean and to check for joint scratches, chipped ends, and imperfect gasket seats. Any and all defective pipe or fittings shall be rejected and removed from the job site. Any defective pipe or fitting discovered after the pipe is laid shall be removed and replaced with a satisfactory pipe or fitting without additional charge.
- B. Handling - Pipe, fittings, manhole sections and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against other pipe.
- C. Care shall be taken to protect PVC pipe from prolonged exposure to direct sunlight (ultraviolet rays).
- D. Construction Equipment - Where sewers are located in or adjacent to pavements, all backfilling and materials handling equipment shall have rubber tires. Tracked (crawler) equipment shall be permitted for use off pavement when there is no danger of damaging pavement or when otherwise permitted by the Butler County Engineer's Office or Ohio Department of Transportation.
- E. Excavated and Construction Materials - All excavated material and all construction materials used in prosecution of the work shall be deposited so as not to endanger the work, create unnecessary annoyance to the public, or interfere with natural drainage courses. During the progress of the work, all material piles shall be kept trimmed up and maintained in a neat, workmanlike manner.
- F. Noise, Dust and Odor Control - The CONTRACTOR's construction activities shall be conducted so as to eliminate all unnecessary noise, dust and odors. The use of oil or other material that may cause tracking for dust control shall not be permitted.
- G. Installation shall be in accordance with ASTM D 2321 except as modified in Sections 3610, 3720 and 3730 of these specifications.
- H. The pipe manufacturer shall provide installation instruction and literature to the CONTRACTOR so that he will be aware of the manufacturer's recommended procedure and practice for installing the pipe and fittings. Copies of these instructions and other literature shall also be provided to the OWNER and ENGINEER. This instruction shall be included at no additional cost to the OWNER. The CONTRACTOR shall install all pipe and fittings according to the manufacturer's recommendations.

- I. Sewer pipe shall be bedded as specified in Section 3730, "Bedding and Backfill for Gravity Sewers".
- J. Before laying the pipe out of the downstream manhole, any obstructions upstream of the manhole that may necessitate changing the line or grade of the pipeline shall be uncovered. The CONTRACTOR shall verify alignment, elevations, and grades prior to proceeding. The CONTRACTOR will be responsible for any necessary relaying and/or relocating of the pipe if the pipe is laid before verifying locations and elevations of known potential obstructions.
- K. Trench Support - Unsupported open cut for sewers will not be permitted where trenching may cause unnecessary damage to street pavement, trees, structures, poles, utilities, or other private or public property or where safety dictates. During the progress of the work, whenever and wherever it is necessary, the CONTRACTOR shall, at his expense, support the sides of the excavation by adequate and suitable sheeting, shoring, bracing, or other approved means. Such trench support material and equipment shall remain in place until backfilling operations have progressed to the point where the supports may be withdrawn without endangering persons or property. Sheeting shall be left in place only if so directed on the Plans. In such cases, the CONTRACTOR shall cut off the sheeting at the depth indicated on the Plans and remove the upper portion. If all the sheeting is to be removed, it shall be removed without causing damage to the pipe. No sheeting, shoring, or bracing will be paid for by the OWNER unless left in place according to the Plans or on written order of the ENGINEER. The OWNER will pay the CONTRACTOR for sheeting, shoring or bracing left in place under the unit bid item (if applicable) or in accordance with the CHANGES IN CONTRACT PRICE of the GENERAL CONDITIONS.
- L. Alignment and Grade - A laser shall be used for horizontal and vertical control of the sewer. Line and grade stakes shall be placed at 25 feet and 50 feet from the downstream manhole and then placed at every 100-foot station to the next manhole and used to verify alignment and grade. The laser unit shall be set up in such a manner that the alignment of the beam is through the pipe directly on the centerline of the pipe or outside the pipe directly above and parallel to the centerline of the pipe. If solvent welded joints are used (or if chemical vapors from other sources are present in the pipe) and the laser unit is set up to aim through the pipe, a blower shall be used to provide positive continuous air circulation within the pipe to minimize deflection of the laser beam. A target shall be established on line and grade at each line and grade stake to check the setting of the laser beam as construction progresses. Also, the alignment of the pipe shall be checked at each line and grade stake by measuring horizontally from the stake to the centerline of the pipe, and the grade shall be checked with a level instrument and a grade pole set on the invert of the pipe. The CONTRACTOR shall ensure that the grade pole is vertically plumb when checking pipe grade.
- M. Pipe Laying - The laying of sewer pipe on the prepared bed in finished trenches shall commence at the lowest point with the spigot ends pointing in the direction of flow. All pipe shall be laid with ends abutting and true to line and grade as shown on the Plans. Pipe sections shall be carefully fitted, matched and aligned so that they will form a sewer with a smooth and uniform invert when laid in the trench. In no case will the supporting of pipes on blocks be permitted.
- N. No backfilling (except for securing pipe in place) over pipe will be allowed until the ENGINEER has had an opportunity to make an inspection of the joints, alignment and grade, in the section laid, but such inspection shall not relieve the CONTRACTOR of further liability in case of defective joints, misalignment caused by backfilling and other such deficiencies that are noted later.
- O. Care should be taken to prevent flotation of the pipe in the event the trench should flood as well as when placing bedding material around the pipe.
- P. Dewatering - Should water be encountered, the CONTRACTOR shall furnish and operate suitable pumping equipment of such capacity adequate to dewater the trench. The trench shall be sufficiently dewatered so that the laying and joining of the pipe is not performed in water. The CONTRACTOR shall convey all trench water to a natural drainage channel or storm sewer without causing any property damage.
- Q. The interior of the pipe shall be clean and dry as the work progresses. Whenever pipe-laying operations are not in progress, the exposed end of the pipe shall be sealed with a plug or bulkhead

fitted into the pipe bell, so as to exclude earth, water, or other material. During excavation and backfilling, the exposed end of the pipe should be blocked to prevent excavated material or backfill material from entering the pipe. A watertight plug or bulkhead shall also be installed and maintained in the most downstream manhole of the project throughout construction to prevent dirt, rocks, muddy water, or other debris from entering the existing sewer system. This plug or bulkhead shall not be removed until the entire sewer has been installed, cleaned, tested, and accepted, unless directed otherwise by the ENGINEER.

- R. If a length of pipe is cut to fit in a line, it shall be cut according to the manufacturers recommendations to leave a smooth end at right angles to the longitudinal axis of the pipe.
- S. No fittings (except service wyes and repair couplings) shall be allowed in gravity sewers. Open ends of wyes shall be plugged or sealed until service laterals are installed.
- T. Pipe Joints - Preparatory to making pipe joints, all joint surfaces shall be cleaned of all dirt, dust, and foreign matter and shall be dry, smooth and free of imperfections before placing jointing materials (ie. gaskets, lubricants, primers, adhesives, etc.). Gaskets, lubricants, primers, adhesives, or other jointing materials shall be used as recommended by the pipe or joint manufacturer's specifications. Generally, lubricants and primers and adhesives shall be placed on both the bell and spigot portions of the joint. The pipe shall then be placed, fitted, joined, and adjusted in such a workmanlike manner as to obtain the degree of water tightness required. In the event that pipe previously laid is disturbed due to any cause, it shall be removed and relaid.
- U. Joints that show leakage will not be accepted. If after backfilling and inspection, any joints are found to be allowing groundwater to enter the sewer, such joints shall be sealed by the CONTRACTOR at no cost to the OWNER.
- V. Steep Slope Protection - Sewers on twenty percent (20%) or greater slopes shall be anchored securely with concrete (or approved equal) anchors spaced as follows:
  - 1. Not over 36 feet center to center on grades 20% - 35%;
  - 2. Not over 24 feet center to center on grades 35% - 50%;
  - 3. Not over 16 feet center to center on grades over 50%.
- 23. Safety - For the security and safety of persons in and adjacent to trenches or construction operations, the safety regulations of the appropriate federal, state or local agencies (including OSHA) shall be followed when specifically applicable, by similarity of operation, or as necessary for adequate protection.
- X. Protection of Trees - Special care shall be taken to avoid damage to trees and their root system. Machine excavation shall not be used when, in the opinion of the ENGINEER, it would endanger the trees. In general, where the trench falls within the limits of the limb spread, headers are required across the trench to protect the tree. The operation of all equipment, particularly when employing booms; the storage of materials; and the deposition of excavation shall be conducted in a manner that will not injure trees, trunks, branches or their roots unless such trees are designated on the Plans for removal.

**PART 3 - BASIS OF PAYMENT:** (Not Applicable)

END OF SECTION