

SECTION 02720

STORM SEWERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Storm sewers and appurtenances.

1.02 UNIT PRICES

- A. Measurement for storm sewers is on a linear foot basis for each type and size of pipe installed. Measurement will be taken along the centerline of the pipe from centerline to centerline of manholes or from end to end of culverts.
- B. No separate payment will be made for earthwork, connections to existing manholes and pipe, accessories, equipment and execution required are incidental to storm sewer work. Include payment in unit price for pipe.

1.03 SUBMITTALS

- A. Submittals shall conform to requirements of all provisions and sections of these specifications.
- B. Submit manufacturer's literature for product specifications and installation instructions.
- C. Submit test reports as specified in Part 3 of this Section.

1.04 QUALITY ASSURANCE

- A. The condition for acceptance will be a storm sewer that is watertight both in pipe-to-pipe joints and in pipe-to-manhole connections.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Comply with manufacturer's recommendations.
- B. Handle pipe, fittings, and accessories carefully with approved handling devices. Do not drop or roll pipe off trucks or trailers. Materials cracked, gouged, chipped, dented, or otherwise damaged will not be approved for installation.
- C. Store pipe and fittings on heavy timbers or platforms to avoid contact with the ground.

- D. Unload pipe, fittings, and specials as close as practical to the location of installation to avoid unnecessary handling.
- E. Keep interiors of pipe and fittings completely free of dirt and foreign matter.

PART 2 PRODUCTS

2.01 PIPE

- A. Piping materials for storm sewers shall be of the sizes and types indicated on the Drawings.
- B. Materials for pipe and fittings, other than those specified or referenced, may be considered for use in storm sewers.
- C. For consideration of other materials, submit complete manufacturer's data including materials, sizes, flow carrying capacity, installation procedures, and history of similar installations to Engineer for pre-bid evaluations, if allowed, or as a substitution.

2.02 PIPE MATERIAL SCHEDULE

- A. Reinforced Concrete Pipe: Conform to requirement of Section 02615 - Reinforced Concrete Pipe.
- B. Monolithic Reinforced Concrete Box Sewers: Conform to requirements of Section 02616 - Monolithic Reinforced Concrete Box Sewers.
- C. Precast Reinforced Concrete Box Sewers: Conform to requirements of Section 02617 - Precast Reinforced Concrete Box Sewers.
- D. When approved by the Owner's Representative, high-density polyethylene, corrugated drainage pipe meeting requirements of AASHTO M252 or M294 and ASTM D3350, Hancor or equal.

2.03 BEDDING, BACKFILL, AND TOPSOIL MATERIAL

- A. Bedding and Backfill Material: Conform to requirements of Sections 02227 - Excavation and Backfill for Utilities, and 02229 - Utility Backfill Material.
- B. Topsoil: Conform to requirements of Section 02920 - Topsoil.

PART 3 EXECUTION

3.01 PREPARATION

- A. Set up street detours and barricades in preparation for excavation if construction will affect traffic. Conform to requirements of Section 01570 - Traffic Control and Regulation.
- B. Provide barricades and warning lights and signs, for excavations. Conform to requirements of Section 01570 - Traffic Control and Regulation. Maintain barricades and warning lights for streets and intersections where work is in progress or where affected by the work and is considered hazardous to traffic movements.
- C. Perform work in accordance with OSHA standards. Employ a Trench Safety System as specified in Section 01526 - Trench Safety Systems, for excavations over 5 feet deep.
- D. Immediately notify the agency or company owning any utility line which is damaged, broken or disturbed. Obtain approval from Owner's Representative and agency for any repairs or relocations, either temporary or permanent.
- E. Remove old pavements and structures including sidewalks and driveways in accordance with requirements of Section 02050 - Demolition and Section 02076 - Removing Existing Pavements and Structures.
- F. Install and operate necessary dewatering and surface water control measures in accordance with Section 01563 - Control of Ground Water and Surface Water.

3.02 EXCAVATION

- A. Earthwork. Refer to Section 02227 - Excavation and Backfill for Utilities and as directed on Drawings.
- B. Line and Grade. Establish the proper line and grade in the trench as shown in the drawings. Maintain this control for a minimum of 100 feet behind and ahead of the pipe-laying operation. Use appropriately sized grade boards, as necessary, which are substantially supported. Protect the boards and location stakes from damage or dislocation. Use of a laser beam equipment to establish and maintain proper line and grade of the work is acceptable.
- C. Trench Excavation. Excavate pipe trenches to a level 8-inches below the indicated invert. Backfill the excavation with the specified bedding material to the level of the lower one-third of the pipe barrel. Tamp and compact backfill to provide bedding at the indicated grade. Form the bedding foundation to a minimum depth of one-eighth of the pipe diameter, but not less than 6 inches.

3.03 PIPE INSTALLATION

- A. Install in accordance with the pipe manufacturer's recommendations and as specified in this Section.

- B. Install pipe only after excavation is completed, the bottom of the trench shaped, bedding material is installed, and the trench has been approved by the Owner's Representative.
- C. Install pipe to the line and grade indicated. Place pipe so that it has continuous bearing of barrel on bedding material and is laid in the trench so the interior surfaces of the pipe follow the grades and alignments indicated.
- D. Install pipe with the spigot ends toward the direction of flow.
- E. Form a concentric joint with each section of adjoining pipe so as to prevent offsets.
- F. Place and drive home newly laid sections with come-a-long winches so as to eliminate damage to sections. Use of backhoes or similar powered equipment will not be allowed unless protective measures are provided and approved in advance by the Owner's Representative.
- G. Keep the interior of pipe clean as the installation progresses. Where cleaning after laying the pipe is difficult because of small pipe size, use a suitable swab or drag in the pipe and pull it forward past each joint immediately after the joint has been completed.
- H. Keep excavations free of water during construction and until final inspection.
- I. When work is not in progress, cover the exposed ends of pipes with an approved plug to prevent foreign material from entering the pipe.

3.04 PIPE INSTALLATION OTHER THAN OPEN CUT

- A. For installation of pipe by augering, boring, or jacking pipe, conform to requirements of Section 02315 - Pipe and Casing Augering for Sewers.

3.05 INSTALLATION OF APPURTENANCES

- A. Construction manholes and inlets to conform to requirements of Sections 02600 - Cast-in-place Concrete Manhole and Section 02601 - Precast Concrete Manholes. Install frames, grate rings and covers to conform to requirements of Section 02603 - Frames, Grates, Rings and Covers.
- B. Install headwalls and wingwalls to conform to requirements of Section 02605 - Cast-in Place Inlets, Headwalls and Wingwalls and Section 02606 - Precast Concrete Inlets, Headwalls and Wingwalls.
- C. Rehabilitate existing manholes to conform to requirements of Section 02764 - Manhole Rehabilitation. Adjust manhole covers to grade conforming to requirements of Section 02607 - Adjusting Manholes, Inlets and Valve Boxes to Grade.

3.06 BACKFILL AND SITE CLEANUP

- A. Backfill the trench only after pipe installation is approved by the Owner's Representative.
- B. Bed pipes with materials conforming to requirements of Section 02229 - Utility Backfill Material and as indicated on Drawings.
- C. Backfill and compact soil in accordance with Section 02227 - Excavation and Backfill for Utilities.
- D. Repair and replace removed or damaged pavement and sidewalks as specified in Section 02570 - Pavement Repair and Resurfacing.
- E. In unpaved areas, grade surface as a uniform slope to natural grade as indicated on the Drawings. Provide a minimum of 4 inches of topsoil and seed according to requirements of Section 02932 - Hydromulch Seeding.
- F. Form to requirements of Section 01564 - Waste Material Disposal.

END OF SECTION