

## SECTION 02720 - STORM SEWER SYSTEM

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY:

- A. This section includes storm sewerage system piping and appurtenances.
- B. Related Sections: The following sections contain requirements that relate to this section:
  - 1. Division 2 Section "Earthwork" for excavation and backfill required for storm sewerage system piping and structures.
  - 2. Division 3 Section "Concrete Work" for precast concrete drainage structures.

#### 1.03 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product Data for drainage piping specialties.
- C. Shop drawings for precast concrete storm drainage catch basins, including frames and grates.
- D. Utility Compliance: Comply with local utility regulations and standards pertaining to storm sewerage systems.

#### 1.04 PROJECT CONDITIONS:

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations. Verify that storm sewerage system piping may be installed in compliance with original design and referenced standards.

Locate existing storm sewerage system piping and structures that are to be removed.

## 1.05 SEQUENCING AND SCHEDULING:

- A. Coordinate with other utility work.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS:

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Underground Warning Tapes:  
  
Allen Systems, Inc.; Reef Industries, Inc.  
Brady (W.H.) Co.; Signmark Div.  
Calpico, Inc.  
Carlton Industries, Inc.  
EMED Co., Inc.  
Seton Name Plate Co.

### 2.02 PIPE AND FITTINGS:

- A. General: Provide pipe and pipe fittings materials compatible with each other.
1. High Density Polyethylene (HDPE) Smooth Interior Pipe: All pipe shall be high density polyethylene smooth interior pipe meeting the requirements of AASHTO M 294 Type S. The pipe shall have annular corrugation. All pipe shall be as manufactured by ADS (Advanced Drainage Systems) N-12 or an approved equal.
    - a. Watertight Sleeves: The watertight sleeves shall be smooth polyethylene with an indentation in the center to ensure proper positioning of the pipe. Sleeves shall be factory installed on one end of the pipe.
    - b. Gaskets: Gaskets shall be a solid cross section ring and meet the requirements of ASTM F 477. A protective removable stretch wrap material shall be placed on all exposed gaskets at the factory.

- c. Lubricant: Gaskets and sleeves shall be lubricated prior to insertion with a compound supplied by the pipe manufacturer.
- d. Fittings: Pipe fittings shall conform to the requirements of AASHTO M 294. Fittings shall have annular corrugations.
- e. Flared End Section: Flared end sections shall be made of high density polyethylene meeting ASTM D 1248 specifications. End sections shall be as manufactured by ADS (Advanced Drainage Systems) or approved equal.

### 2.03 CATCH BASINS/DRY WELLSs:

- A. Precast Concrete Catch Basins or Dry Wells: ASTM C 478 or ASTM C 858, precast reinforced concrete, of depth indicated. Sections shall have provision for rubber gasket joints. Base section slab shall have minimum thickness of 6 inches, riser section shall have minimum thickness of 6 inches and have inside dimensions as shown on the drawings. Precast concrete shall conform to Section 03410.
  - 1. Riser Sections: Sections shall be of lengths to provide depth indicated.
  - 2. Top Section: Flat slab type with opening to match grade rings.
  - 3. Grade Rings: Provide 2 or 3 reinforced concrete rings, of 6 to 9 inches total thickness.
  - 4. Gaskets: ASTM C 443, rubber.
  - 5. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- B. Catch Basin or Dry Well Frames and Grates: Bicycle Safe heavy-duty frame and grate #3404 as manufactured by Syracuse Castings or approved equal.

### 2.04 IDENTIFICATION:

- A. Metallic-Lined Plastic Underground Warning Tapes: Polyethylene plastic tape with metallic core, 6 inches wide by 4 mils thick, solid green in color with continuous printed caption in black letters "CAUTION - STORM SEWER LINE BURIED BELOW."

## PART 3 - EXECUTION

### 3.01 PREPARATION OF FOUNDATION FOR BURIED STORM SEWERAGE SYSTEMS:

- A. Grade trench bottom to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.
- B. Remove unstable, soft, and unsuitable materials at the surface upon which pipes are to be laid, and backfill with clean sand or pea gravel to indicated level.
- C. Undercut bottom of trench to a depth of 6" and backfill pipe as shown on drawings.

### 3.02 INSTALLATION, GENERAL:

- A. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of the underground storm sewerage system piping. Location and arrangement of piping layout take into account many design considerations. Install the piping as indicated, to the extent practical.
- B. Install Piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.
- C. Use catch basins for changes in direction, except where a fitting is indicated. Use fittings for branch connections, except where direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings, where different size or material of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.

### 3.03 CATCH BASINS:

- A. Construct catch basins/drywells to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

### 3.04 END SECTIONS:

- A. Install Tide Flex - TF-1 Check Valve (or approved equal) in accordance with manufacturers recommendations or as shown on the detailed plans.

### 3.05 TAP CONNECTIONS:

- A. Make connections to existing piping and underground structures so that finished work will conform as nearly as practicable to the requirements specified for new work.

### 3.06 INSTALLATION OF IDENTIFICATION:

- A. Install continuous plastic underground warning tape during backfilling of trench for underground storm sewer piping. Locate 6 to 8 inches below finished grade, directly over piping.

### 3.07 FIELD QUALITY CONTROL:

- A. Testing: Perform testing of completed piping in accordance with these specifications.
- B. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.

In large, accessible piping, brushes and brooms may be used for cleaning.

Place plugs in ends of uncompleted pipe at end of day or whenever work stops.

Flush piping between catch basins, if required by local authority, to remove collected debris.

- C. Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred.

Make inspections after pipe between catch basins have been installed and approximately 2 feet of backfill is in place, and again at completion of project.

If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects and reinspect.

### 3.08 QUALITY CONTROL

- A. Inspection Services: The Engineer shall maintain a resident inspector on the project. The Contractor shall assist the inspector in every way possible in order to verify the quality of their work.

- B. Inspection and Testing of Storm Sewer Lines and Catch Basins General: Upon completion of the installation and backfilling portions of the storm sewer, the pipe shall be inspected by one of several of the methods subsequently described. This inspection and testing shall be undertaken as the work progresses. The Engineer shall be notified in advance of such inspection and testing and the Contractor shall provide all facilities, materials, equipment and labor required for such testing. Such inspection and testing shall be a prerequisite for acceptance of all work.

Visual Inspection: An inspection of the interior of the completed storm sewer pipe by direct visual inspection shall be made for all pipe installation from catch basin to catch basin. Any lights, equipment or labor necessary for such inspection shall be provided by the Contractor.

Any foreign material found in the interior of the sewer, any dirt, debris or other objects, shall be removed by the Contractor. Visible defects, such as broken pipe sections, improperly installed gaskets, projecting connections, cracks, visible leaks or other defects, shall be noted, corrected and the pipe reinspected.

END OF SECTION 02720