

SECTION 33 49 23
UNDERGROUND STORMWATER STORAGE CHAMBERS

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies construction of outside, underground stormwater storage systems. The underground stormwater storage systems shall be complete and ready for operation, including all storage structures, drainage structures, frames, grates and covers, connections to inlet and outlet structures, structure service lines, existing storm sewer lines and existing drainage structures and all required incidentals.

1.2 RELATED WORK:

- A. Excavation, Trench Widths, Pipe Bedding, Backfill, Shoring, Sheeting, Bracing: Section 31 20 00, EARTH MOVING.
- B. Construction of Stormwater Utilities: Section 33 40 00 STORM DRAINAGE UTILITIES
- C. Concrete Work, Reinforcing, Placement and Finishing: Section 03 30 53, CAST-IN-PLACE CONCRETE.
- D. Fabrication of Steel Ladders: Section 05 50 00, METAL FABRICATIONS.
- E. Protection of Materials and Equipment: Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.
- F. Section 31 08 00 , Commissioning of Site Utility Systems.

1.3 QUALITY ASSURANCE:

- A. Products Criteria:
 - 1. Multiple Units: When two or more units of the same type or class of materials or equipment are required, these units shall be products of one manufacturer.
 - 2. Nameplates: Nameplate bearing manufacturer's name, or identifiable trademark, securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped, or otherwise permanently marked on each item of equipment.

1.4 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturers' Literature and Data: Submit the following as one package:
 - 1. Chambers. Include certification that AASHTO H-20 loading is met for site specific application.
 - 2. Pipes and/or Manifold systems.
 - 3. Manhole, inlet and catch basin material (if not covered under 33 40 00 Storm Drainage Utilities.

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- 4. Frames and covers, including inspection ports.
- 5. Geotextiles
- 6. Resilient connectors.
- C. One copy of Manufacturer's installation procedures.
- D. One copy of Manufacturer's maintenance procedures.
- E. One copy of calculations showing volume by elevation and hydrologic calculations if alternate manufacturers units are proposed for use.

1.5 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - A48-03/A48M-03.....Gray Iron Castings
 - A615-05/A615M-05.....Deformed and Plain-Billet Steel Bars for
Concrete Reinforcement
 - C139-03.....Concrete Masonry Units for Construction of Catch
Basins and Manholes
 - C150-04ae1.....Portland Cement
 - C443-05/C443M-05.....Joints for Concrete Pipe and Manholes, Using
Rubber Gaskets
 - C478-03a/C478M-03a.....Precast Reinforced Concrete Manhole Sections
 - C1433-04e1/C1433M-04e1..Precast Reinforced Concrete Box Sections for
Culverts, Storm Drains and Sewers
 - C857-95(2001).....Minimum Structural Design Loading for
Underground Precast Concrete Utility Structures
 - C923-02/C923M-02.....Resilient Connectors between Reinforced Concrete
Manhole Structures, Pipes and Materials
 - C924-02/C924M-02.....Testing Concrete Pipe Sewer Lines by Low
Pressure Air Test Method
 - C1103-03/C1103M-03.....Joint Acceptance Testing of Installed Precast
Concrete Pipe Sewer Lines
 - D698-00ae1.....Laboratory Compaction Characteristics of Soil
Using Standard Effort (12,400 ft-lbf/ft³ (600
kN-m/m³))
 - D1056-00.....Flexible Cellular Materials-Sponge or Expanded
Rubber
 - D2412-02.....Determination of External Loading
Characteristics of Plastic Pipe by Parallel
Plate Loading

- D2321-04e1.....Underground Installation of Thermoplastic Pipe
for Sewers and Other Gravity Flow Applications .
- D3034-04a.....Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe
and Fittings
- D3212-96a(2003)e1.....Joints for Drain and Sewer Plastic Pipes Using
Flexible Elastomeric Seals
- D3350-04.....Polyethylene Plastics Pipe and Fittings
Materials
- D4101-05a.....Polypropylene Injection and Extrusion Materials
- F477-02e1.....Elastomeric Seals (Gaskets) for Joining Plastic
Pipe
- F679-03.....Poly (Vinyl Chloride) (PVC) Large-Diameter
Plastic Gravity Sewer Pipe and Fittings
- F714-05.....Polyethylene (PE) Plastic Pipe (SDR-PR) Based on
Outside Diameter
- F794-03.....Poly (Vinyl Chloride)(PVC) Profile Gravity Sewer
Pipe and Fittings Based on Controlled Inside
Diameter
- F894-98a.....Polyethylene (PE) Large Diameter Profile Wall
Sewer and Drain Pipe
- F949-03.....Poly (Vinyl Chloride) (PVC) Corrugated Sewer
Pipe with Smooth Interior
- F1417-92(2005).....Installation Acceptance of Plastic Gravity Sewer
Lines Using Low-Pressure Air

NOTE: ASTM test methods shall be the current version as of the date of
advertisement of the project.

C. American Association of State Highway and Transportation Officials
(AASHTO):

- HB17.....Standard Specifications for Highway Bridges
- H20.....Standard Specifications for Gray Cast Iron
Covers and Grates
- M190-04.....Bituminous Coated Corrugated Metal Culvert Pipe
and Pipe Arches
- M198-05.....Joints for Circular Concrete Sewer and Culvert
Pipe Using Flexible Watertight Gaskets
- M288.....Geotextile Specification for Highway
Applications
- M294-04.....Corrugated Polyethylene Pipe, 300-1500 mm (12 to
60 inches) Diameter

PART 2 - PRODUCTS

2.1 CHAMBERS:

A. Manufacturer:

1. Prefabricated, modular chamber units shall conform to chamber systems as listed on the plans, or approved equal.

A. Materials:

1. Chambers shall be constructed be injection molded polypropylene resin and conform to the requirements of ASTM F-2418-05, "Standard Specifications for Polypropylene Corrugated Stormwater Collection Chambers". Chambers shall be manufactured to withstand AASHTO H-20 loadings.
2. Pipes and fittings shall conform to the specifications stated in Section 30 40 00, STORM DRAINAGE UTILITIES.
3. Manholes, catch basins, and other storm drainage structures associated with the underground stormwater storage chambers shall conform to the specifications of Section 30 40 00, STORM DRAINAGE UTILITES.

PART 3 - EXECUTION

3.1 EXCAVATION FOR CHAMBER BED:

Excavation for chamber bed and backfilling for underground stormwater storage chambers shall be in accordance with the applicable portions of Section 31 20 00, EARTH MOVING.

3.2 INSTALLATION:

Installation shall conform to requirements set forth by manufacturer of underground stormwater storage chambers to be installed.

3.3 CLEANUP & TESTING:

Chamber system shall be cleaned of all debris by jet vac procedure after surrounding pavement is installed & site stabilized. System shall be televised after cleaning & video CD's provided to VA.

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