

SECTION XXX-XX UNDERGROUND CHAMBER STORAGE SYSTEM

PART 1 – GENERAL

1.1 Summary

- 1.1.1 The conditions of the Contract and all sections of the Contract are hereby made a part of this Section
- 1.1.2 Construction documents for the project include one or more underground chamber storage systems to be constructed as part of the conditions of the general contract. Construction shall be in accordance with the approved construction plans and shall be coordinated with the engineer of record and/or the project engineer. The chamber manufacturer shall be consulted, as necessary, to ensure the application is consistent with the general use of their product. Installation of the Chamber system shall be in accordance with the Manufacturer's installation requirements.
- 1.1.3 The underground chamber storage system(s) includes a defined structural backfill envelope completely enclosed in a geotextile wrap to maintain separation from adjacent materials and preserve the stormwater storage characteristics of both the stone backfill and chambers.
- 1.1.4 Backfilling and construction above the geotextile wrapped structural backfill envelope of the underground chamber storage system(s) is outside the scope of this section.

1.2 Methods

- 1.2.1 Work may involve demolition, earth moving, land clearing and grubbing, or other items not covered in this section. All work shall be performed in accordance with the Contract documents and specifications for the project.
- 1.2.2 Work includes underground construction techniques, consistent with the construction of underground utilities and subsurface drainage systems, and requires an understanding of geotechnical reports and experience mitigating underground anomalies.
- 1.2.2 Installation of the underground chamber system(s) includes proper excavation and base preparation in accordance with the Geotechnical Engineer's recommendations and as shown on the plans to facilitate construction of the structural backfill envelope of the chamber system(s), including proper assembly and placement of the chambers and related appurtenances (e.g. end caps, cleanouts, manifolds, geotextiles).
- 1.2.3 Provide and Install StormKeeper Underground Storage chambers including related geotextiles, storm piping, inspection ports, and other required appurtenances in accordance with the manufacturer's installation guidelines and specifications.

1.3 Method of Measurement and Payment

- 1.3.1 Payment for each StormKeeper underground chamber storage system shall be made on a lump sum basis upon satisfactory completion of the entire structural backfill envelope defined for the underground chamber storage system.

1.4 Specification References

- 1.4.1 The following specification references shall serve as a guide to engineering materials supplied for the construction of the StormKeeper underground chamber storage system:

ASTM F2418	Standard Specification for Polypropylene (PP) Corrugated Wall Stormwater Collection Chambers
ASTM F2648	Standard Specification for 2 to 60 inch Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications
AASHTO M288	Geotextile Specification for Highway Applications
AASHTO M43	Sizes of Aggregate for Road and Bridge Construction

1.4.2 The following specification references shall serve as a guide to the installation of the underground chamber storage system:

ASTM D2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
AASHTO	Section 30 of the AASHTO LRFD Bridge Construction Specifications
STORMKEEPER	StormKeeper installation instructions for SK75 and SK180 chambers.

1.4.3 The following specification references shall serve as a guide to the structural adequacy of the underground chamber storage system:

ASTM F2787	Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers
AASHTO	Section 12 of the AASHTO LRFD Bridge Design Specifications

1.5 Submittals

1.5.1 The following submittals shall be made to certify engineering materials used for the construction of the underground chamber storage system:

- a) Manufacturer's certification the chambers supplied meets ASTM F2418.
- b) Shop drawings and fitting fabrication details of the complete manifold pipe system connected to and made a part of the underground chamber storage system.
- c) Structural backfill material certifications.
- d) Material certifications for all woven and non-woven geotextiles.

PART 2 – PRODUCTS

2.1 Chambers

- 2.1.1 Chambers shall be injection molded and constructed of virgin polypropylene resins resistant to environmental stress cracking (ESCR) and with ability to maintain adequate stiffness through the construction and service life of the chamber.
- 2.1.2 The chamber shall have vent locations near the top that shall also allow for the installation of an inspection port.
- 2.1.3 Chambers shall be certified to and fully compliant with the latest version of ASTM F2418.
- 2.1.4 Chambers required to meet the ASTM F2418 30x51 nominal chamber classification shall be StormKeeper SK75 or approved equal. Chambers required to meet the ASTM F2418 45x77 nominal chamber classification shall be StormKeeper 180 or approved equal.
- 2.1.5 Chambers shall have handles installed in the base to facilitate construction of the system.
- 2.1.6 Chambers shall be certified to be structurally adequate for the application in accordance with the latest version of ASTM F2787. The structural analysis shall also be consistent with the method detailed in Section 12.12 of the AASHTO LRFD Bridge Design Specifications.
- 2.1.7 Chamber rows shall provide continuous, unobstructed internal space with no internal support panels.

- 2.1.8 Chambers shall be produced at an ISO 9001 certified manufacturing facility.

2.2 Chamber End Caps

2.2.1

- 2.2.2 The end cap shall be designed to fit into any corrugation along the length of the chamber providing the ability to trim a chamber and affix the end cap at any desired row length.

- 2.2.3 The end cap shall contain circular guides to facilitate the cutting and removal of connection openings for the various pipe diameters used to inlet water into the system. The guides shall be integrated as part of the end cap manufacturing process.

- 2.2.4 The end cap shall have adequate structural capacity to allow the end cap inlet openings to be cut and removed at any invert elevation.

- 2.2.5 The face of the endcap shall be curved.

- 2.2.8 The end cap shall have a cut out provided for the installation of a cleanout or inspection port.

PART 3 – EXECUTION

3.1 General

- 3.1.1 Chamber system assembly shall proceed on top of a properly bedded excavation at the elevation established by the engineer and shown on the approved construction plans. The subgrade and trench walls shall be stable and free of any soft or unyielding material, being properly prepared in accordance with the applicable sections of ASTM D2321 or Section 30 of the AASHTO LRFD Bridge Construction Specifications. The subgrade and trench walls shall be lined with the specified geotextile before placement of the bedding material.
- 3.1.2 The chamber system shall be duly protected, as necessary, from construction equipment, related vehicles, and other traffic during construction.

3.2 Chamber System Assembly

- 3.1.1 Assembly of chambers and related appurtenances shall be in accordance with the manufacturer's literature guidelines or recommendations.
- 3.1.2 The assembly and connections of the manifold system(s) shall be in accordance with the shop drawings.
- 3.1.2 The placement of the chamber system shall be to the line and grade identified on the approved construction plans. Chamber rows shall be straight, continuous, and uniformly spaced.
- 3.1.4 Geotextile shall be directly placed under the chamber segments identified in the manufacturer's installation guide.

3.2 Chamber System Installation

- 3.2.1 The installation of the chambers shall be in accordance with the manufacturer's latest installation guidelines and consistent with the methods identified in ASTM D2321 and/or Section 30 of the AASHTO LRFD Bridge Construction Specifications.
- 3.2.2 The installation of the underground chamber storage system is complete once the structural backfill envelope has been completely enclosed with geotextile per the project details.
- 3.2.3 Secure the placement of the geotextile atop the structural backfill envelope of the underground chamber storage system.