

CONSTRUCTION SPECIFICATION OUTLINE

1 INTRODUCTION

The construction and installation of stormwater systems vary depending on site conditions and the system's design criteria. This document is intended for use after the system has been designed and the stormwater products have been selected. The general information listed in this document should be obtained and included in the construction package. This document is applicable to roof storage, underground storage, and flow control products.

Always refer to the manufacturer's installation instructions and project-specific engineering drawings to ensure compliance with project requirements. All installation procedures shall be carried out in accordance with the applicable specifications, approved construction drawings, and the manufacturer's specifications.

This document is intended for guidance only. The engineer of record is responsible for ensuring that all design and construction activities comply with relevant codes, standards, and project-specific requirements. This document does not supersede manufacturer instructions, engineering drawings, or regulatory requirements.

2 UNDERGROUND STORAGE

There are various categories of underground storage, such as concrete, HDPE, arched, and modular storage products. Once a product has been selected, the following information should be included in the construction package.

2.1 Product Information Requirements

Design and Structural

- **Loading Restrictions:** Specify the construction equipment that can be operated on the bed, adjacent too or on top of the product before the minimum cover material is fully installed. Also clearly notate the maximum loading that the finished product can withstand once cover material has been placed. The engineer of record must verify all loading details for each specific project.
- **Minimum/Maximum Cover:** Specify soil depth from finished surface elevation to the top of the product. Differentiate the cover requirements if the minimum/maximum cover is only to the bottom of the pavement.
- **Maximum Burial Depth:** If there can be multiple product layers in a storage system, specify the maximum depth from ground elevation to the bottom of the product.
- **Overland Escape Route:** Specify the grading requirements for the overland escape route to the public roadway. An overland escape route is required for all underground storage systems.

Materials and Products

- **Backfill Material:** Specify the acceptable locally available materials that are permitted for use as fill for the product.
- **Product Material Specifications:** Specify material or class of material used in the product, such as HS cement, Grade 304 stainless steel, or galvanized steel.
- **Standards Applied:** Specify CSA, ASTM, or other equivalent standards that are followed and adhered to in the design and manufacturing of products.
- **Liner Specification:** Specify the required type and strength of the liner permitted to be used.

Site and Spatial

- **Construction Site Footprint:** Specify the excavation area required to install the product and minimum setback from buildings and other site infrastructure. Any deviation from the minimum setback requires confirmation and signoff by the engineer of record.
- **Utility Conflicts and Clearance Requirements:** Specify the minimum lateral distance required between the edge of the product and surrounding infrastructure, such as other pipes, manholes, buildings, telecommunications, or electrical lines. The engineer of record should assess the separation requirements based on site-specific geotechnical and structural considerations.
- **Geotechnical Requirement/Restrictions:** Specify bedding or subgrade soil condition required, such as bearing capacity and groundwater conditions. If adverse conditions are encountered, review with an engineer / product supplier to determine suitable modifications.
- **Foundation Requirements and Details:** Specify any foundation requirements for the underground storage (e.g. concrete base).

Installation

In addition to the City of Calgary Standard Specifications Sewer Construction, specify other installation specifications that should be followed, including but not limited to the following:

- **Compaction Requirement:** Specify the minimum subgrade and backfill compaction requirements below and around the storage, the depth of fill material required before compaction can begin, the maximum lifts for additional layers of compaction, as well as the minimum Proctor density or relative density.
- **Connection Requirements:** Specify any connection requirements between the underground storage and connecting infrastructure (i.e. pipes).
- **Handling and Lifting Requirements:** Specify any considerations and care needed in the handling and lifting of products during the unloading and installation of the products.
- **Quality Control Documentation:** Specify procedures that outline how quality standards are maintained throughout the construction of the storage and manufacturing process.
- **Damage Control:** Specify the procedures and contact information in the event of damage to the product.

3 ROOF STORAGE

Roof storage refers to any roof specifically designed to temporarily detain stormwater that is not a green roof or a blue roof. Once the storage has been designed, the following information should be included in the construction package. This section only includes the additional considerations for the roof and does not replace the requirements for standard roof construction.

3.1 Product Information Requirements

Design and Structural

- **Loading Requirements:** Specify the loading requirements of the building to include the additional load of the stored water. The engineer of record must verify all loading details for each specific project.
- **Overflow Escape Route:** Specify any requirements for the overflow escape route to the ground level.

Materials and Products

- **System Connection Materials:** Specify the necessary details for connecting the roof storage to the ground system. The engineer of record must verify all connection details for each specific project.

Site and Spatial

- **Roof Slope Requirements:** Specify the required roof slopes to ensure proper drainage across the roof surface.

Installation

In addition to the National Building Code – Alberta Addition and the National Plumbing Code of Canada, specify other installation specifications that should be followed, including but not limited to the following:

- **Damage Control:** Specify the procedures and contact information in the event of damage to the building during construction.

4 FLOW CONTROL DEVICES

Various devices are used to control flows in stormwater management systems, such as orifice plates, vortex control systems, pumps, and roof weirs. Once a system has been designed and a product has been selected, the following information should be included in the construction package.

4.1 Product Information Requirements

Design and Structural

- **Electrical Details (Pump Only):** Specify the electrical requirements for the specific pump system including the required backup power configuration.

Materials and Products

- **Product Material Specifications:** Specify material or class of material used in the product, such as HS cement, Grade 304 stainless steel, or galvanized steel.
- **Standards Applied:** Specify CSA, ASTM or other equivalent standards that are followed and adhered to in the design and manufacturing of products.
- **Connection Materials:** Specify the materials necessary to attach the product to manholes (e.g. washers, nuts, solvent cement).

Site and Spatial

- **Clearance Requirements:** Specify the spacing between the edge of the product and the bottom/top/walls of the manhole or roof edge.

Installation

In addition to the City of Calgary Standard Specifications Sewer Construction, specify other installation specifications that should be followed, including but not limited to the following:

- **Handling and Lifting Requirements:** Specify any considerations and care needed in the handling and lifting of products during the unloading and installation of the products.
- **Quality Control Documentation:** Specify procedures that outline how quality standards are maintained throughout the construction of the storage and manufacturing process.
- **Damage Control:** Specify the procedures and contact information in the event of damage to the product.

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