



# TOWN OF GEORGETOWN CONSTRUCTION STANDARDS

## Chapter 5

### Storm Drainage System

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## **CHAPTER 5 STORM DRAINAGE SYSTEM**

### **5.00.0 INTRODUCTION**

All storm sewer systems shall comply with the requirements of these CONSTRUCTION STANDARDS. All work performed according to this section must comply with the general requirements contained within Chapter 1. Special criteria shall be outlined at pre-design meetings and in the approved construction plans, as determined necessary by the Town.

### **5.10.0 DESIGN CRITERIA**

All subdivisions, re-subdivisions, planned unit development, or any other proposed construction submitted for approval under the provisions of Georgetown's Municipal Code shall include adequate storm drainage system analysis and appropriate drainage system plans, wet stamped by a licensed professional engineer, in conformance with the requirements established by the Urban Storm Drainage Criteria Manual, Volumes 1 - 3, (USDCM) as prepared by the Urban Drainage Flood Control District. In applying the approaches outlined in the USDCM, the Town provides the following additional guidance:

- (A) Storm Runoff from newly developed land shall not exceed historic drainage conditions
- (B) Initial storm drainage improvements shall be designed to carry a 5 year storm frequency
- (C) Major storm drainage improvements shall be designed to carry a 100 year storm frequency
- (D) Storm water quality treatment shall be based on the Excess Urban Runoff Volume
- (E) Storm runoff treatment shall employ full spectrum detention and be designed for the 5 and 100 year storm frequencies

### **5.20.0 CONSTRUCTION SPECIFICATIONS**

#### **5.21.0 EXCAVATION AND TRENCHING**

Excavation, trenching and backfilling shall be done in accordance with Chapter 8 of these CONSTRUCTION STANDARDS.

#### **5.22.0 BEDDING**

In the event unstable trench conditions are found at pipeline grade, a minimum of 1-1/2 inch uniformly graded washed rock shall be used for trench stabilization. Depth of stabilization shall be as approved by the Town.

##### **5.22.1 General**

Pipe bedding shall be done in accordance with Sections 5.22.2 or 5.22.3 of these CONSTRUCTION STANDARDS and the details in Chapter 4.

##### **5.22.2 Class A Bedding**

See Section 4.41.2 of these Standards.

##### **5.22.3 Class B Bedding (Granular II)**

See Section 4.41.3 of these Standards.

## **5.23.0**

### **PIPELINE INSTALLATION**

#### **5.23.1 General**

The Town shall be notified at least 48 hours in advance of any pipe installation. The Responsible Party shall notify and arrange for all utility locates prior to excavation. No pipes shall be backfilled until they have been inspected by the Town. Alignment and grade of the pipe and the location of fittings, manholes and inlets shall be staked under the supervision of a Colorado registered professional land surveyor.

Proper implements, tools and facilities shall be provided and used by the Responsible Party for the safe and convenient execution of the work. All pipe sections, pre-cast manholes and inlets sections, shall be carefully lowered into the trench by means of a straps, ropes or other suitable tools or equipment to prevent damage to storm sewer line material. Under no circumstances shall storm sewer line materials be dropped or dumped into the trench.

All pipe-fittings shall be carefully examined for cracks and other defects immediately before installation. The groove in the bells of the pipe shall be full and continuous or the pipe will be rejected. Defective pipe or fittings shall be removed from the job site within 24 hours of notification by the Town. All foreign matter or dirt shall be removed from the interior and ends of the pipe before they are lowered into position in the trench and prior to connection.

Every precaution shall be taken to prevent foreign material and trench water from entering the pipe and fittings. During construction, the Responsible Party shall provide and maintain adequate equipment to properly remove and dispose of all water entering the trench and any other part of the work.

#### **5.23.2 Pipe**

Pipe shall be laid from downstream to upstream with spigot ends pointing downstream. All pipe shall be placed true to line and grade and carefully centered and with a smooth invert at the joint. The joint shall be made in a workmanlike manner and shall be watertight. Immediately before joining two lengths of pipe, the inside of the bell and the outside of the spigot end and the gasket shall be thoroughly cleaned. Caution shall be exercised to ensure that the correct type of gasket is used. A thin film of gasket lubricant shall be applied to the inside face of the gasket and the spigot end of the pipe. The spigot end of the pipe shall be placed in the bell with care to prevent the joint from contacting the ground. The joint shall be completed by pushing the pipe home with a slow steady pressure without jerky or jolting movements. Pipe shall not be furnished without a depth assembly to ensure insertion to the full depth of the joint.

Cutting of pipe for inserting closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or lining, leaving a smooth end at tight angles to the axis of the pipe.

No pipe or appurtenant structure shall be installed upon a foundation in which frost has penetrated or at any time when the Town deems there is a danger of ice formation or frost penetrations at the bottom of the excavation. No pipe or appurtenant structure shall be installed unless backfilling can be completed before the formation of ice and frost.

## **5.24.0**

### **MANHOLE CONSTRUCTION**

#### **5.24.1 Cast-in-Place Base**

See Section 4.43.I of these CONSTRUCTION STANDARDS.

#### **5.24.2 Pre-Cast Base/Inverts**

See Section 4.43.2 of these Standards.

#### **5.24.3 Pre-Cast Barrel**

See Section 4.43.3 of these Standards.

#### **5.24.4 Inlets**

Inlets shall be constructed with Class A concrete, placed on undisturbed ground and in conformance with the STANDARD DETAILS in Chapter 6. The top portion of inlets shall be constructed concurrently with the adjacent curb and gutter to ensure proper alignment of grades unless otherwise permitted in writing by the Town.

#### **5.24.5 Manhole/Inlet Grouting Treatment**

See Section 4.43.4 of these Standards.

#### **5.24.6 Adjustment Rings**

See Section 4.43.5 of these Standards.

### **5.25.00 CONNECTIONS TO EXISTING MANHOLES**

See Section 4.44.0 of these Standards.

### **5.30.00 TESTS**

#### **5.31.00 GENERAL**

See Section 4.49.0 of these Standards.

##### **5.31.1 Lamping Test**

See Section 4.49.4 of these Standards.

##### **5.31.2 Manhole Leakage Test**

See Section 4.49.6 of these Standards.

##### **5.31.3 TV Inspection**

See Section 4.49.07 of these Standards.

**5.40.0 MATERIAL SPECIFICATIONS**

**5.41.0 GENERAL**

See Section 4.60.0 of these Standards and Specifications.

**5.42.0 DEFECTS**

See Section 4.61.0 of these Standards and Specifications.

**5.43.0 CERTIFICATION**

See Section 4.62.0 of these Standards and Specifications.

**5.44.0 PIPE**

**5.44.1 Polyvinyl Chloride Pipe (PVC)**

See Section 4.63.1 of these Standards.

**5.44.2 Reinforced Concrete Pipe (RCP)**

See Section 4.63.2 of these Standards and Specifications.

**5.44.3 Corrugated Aluminum Pipe (CAP)**

CAP and coupling bands for culverts shall conform to the requirements of AASHTO M-196 Type I or Type II. The pipe shall be fabricated with helical corrugations and a continuous lock seam. CAP shall be joined with gasketed coupling bands made of the same alloy as the pipe. Bands shall be corrugated to match the pipe ends and form a watertight seal. Gasket material shall be neoprene or other approved synthetic rubber.

**5.44.4 Corrugated Polyethylene (PE) Pipe**

Corrugated polyethylene pipe shall conform to AASHTO M-252 for sizes 3" through 10" and to AASHTO M-294 for sizes 12" through 36". PE pipe for storm drains shall have a smooth interior (Type S).

**5.44.5 Other Pipe Materials**

All other pipe materials shall be submitted with a sample and specifications from the manufacturer during design for consideration and may only be used with written permission from the Town. Pipe materials not approved prior to construction will not be considered for use.

## **5.45.0**

### **MANHOLES**

#### **5.45.1 General**

See Section 4.64.1 of these Standards.

#### **5.45.2 Manhole Rings and Covers**

See Section 4.64.2 of these Standards.

#### **5.45.3 Manhole Base Slabs**

See Section 4.64.3 of these Standards.

#### **5.45.4 Joint Material**

See Section 4.64.4 of these Standards.

#### **5.45.5 Mortar**

See Section 4.64.5 of these Standards.