

ARTICLE XIV

STORMWATER MANAGEMENT MANUAL

14.1 Stormwater Management Manual

Volume 1 and Volume 2 of the Gwinnett County Stormwater Management Manual (GC SMM) are hereby adopted by reference, as if set forth in their entirety herein, as the Stormwater Manual for the City of Lawrenceville and shall be referred to as either “Stormwater Manual” or “City of Lawrenceville Stormwater Manual”. A printed copy of the Stormwater Manual may be obtained (for cost of printing) from the Engineering Department. The Stormwater Manual can be accessed at the following link:

https://www.gwinnettcountry.com/static/departments/DWR/pdf/GCSMM_1.0.pdf.

The Stormwater Manual may be updated from time to time. Amendments to the GC SMM that apply within the boundaries of the City of Lawrenceville are set forth in Section 14.2 below. The provisions of said manual shall be in full force and effect within the City of Lawrenceville and shall be enforced by any and all City Departments and by the Municipal Court of the City of Lawrenceville.

14.2 Amendments to Stormwater Management Manual

14.2.1 City of Lawrenceville Storm Sewer Pipe Standards

Any reference within the GC SMM to Gwinnett County Storm Sewer Pipe Standards are hereby superseded by and replaced with the City of Lawrenceville Storm Sewer Pipe Standards which are set out in Sections 14.2.1.1 through 14.2.1.6 of the Development Regulations and the referenced Pipe Materials Alternatives chart. Notwithstanding any provisions founding in the GC SMM, the Storm Sewer Pipe Standards set forth in Sections 14.2.1.1 through 14.2.1.6 of the Development Regulations and the referenced Pipe Materials Alternatives chart shall control for all development within the City of Lawrenceville.

14.2.1.1 Standard Specifications

- (1) Unless otherwise specifically set forth herein or in the Gwinnett County Standard Drawings, all of the materials, methods of the construction, and workmanship for the work covered in reference to stormwater conveyance facility construction shall conform to the most recent Standard Specifications of the Georgia Department of Transportation (Georgia DOT).
- (2) Allowable pipe material for various applications in drainage easements and public street rights-of-way, except as specified below, are Aluminum Coated (Type 2) Corrugated Steel Pipe (ASP), Corrugated Aluminum Alloy Pipe, Smooth Lined Corrugated Polyethylene Pipe (PE), Corrugated Polyethylene Pipe, or Reinforced Concrete Pipe (RCP). Usage is summarized in the table below titled Pipe Material Alternatives. Allowable pipe materials are indicated by an “X” in the table.

- (3) For roads constructed with public funds, either wholly or in part, or roads classified as Major Thoroughfares, materials which meet the Georgia DOT design standards shall be used unless an alternative is specifically approved by the City of Lawrenceville Engineering Department.
- (4) Only Reinforced Concrete Pipe (RCP) shall be used for all dams unless the Georgia Safe Dams Program requires another material.
- (5) Reinforced Concrete Pipe (RCP) shall be used under all streets and roads.

14.2.1.2 Minimum Pipe and Pipe Coating Requirements

- (1) The type of pipe material used shall be in accordance with section 14.2.1.1 herein.
- (2) Reinforced concrete pipe shall be in not less than 8-foot joint lengths. All joints shall be bell and spigot type, with a rubber gasket conforming to ASTM C-443. Pipe shall be manufactured in accordance with AASHTO M-170 and/or ASTM C-76. Class of pipe and wall thickness shall be in accordance with 1030-D, Georgia DOT specification, Table No.1.
- (3) Aluminum coated (Type 2) steel pipe shall comply with AASHTO M-274 for the coating and AASHTO M-36 for the pipe fabrication. Aluminum alloy pipe shall comply with AASHTO M-196 for material and fabrication.
 - (a) All corrugated aluminum coated steel or aluminum alloy pipe not carrying a live stream may be plain. All corrugated aluminum coated steel or aluminum alloy pipes, which will carry a live stream, shall have paved inverters pursuant to AASHTO M-190, Type C, except that the pipe need not be fully coated.
 - (b) See the Gwinnett County Standard Drawings for the minimum acceptable combinations of gauges, diameters, and corrugation configurations for corrugated aluminum alloy pipe and pipe arches, and for corrugated aluminum coated steel pipe and pipe arches.
 - (c) Each end of each pipe section, to be joined by a coupling band, shall have a minimum of two annular corrugations. Coupling bands shall be so constructed to lap on an equal portion of each of the pipe sections to be joined. The connecting bands shall have a minimum of two annular corrugations and fully engage, over the entire pipe periphery, one corrugation on each pipe. Bands shall be fabricated from the same material as the pipe. The minimum band gauges for aluminum pipe and aluminized pipe shall be as specified in AASHTO M-196, Section 19, and AASHTO M-36, Section 9, respectively.
 - (d) Gaskets may be required as determined by the City in the field, and shall be either sleeve type or O-ring type and shall meet the requirements for gaskets as specified in AASHTO M-36, Section 9.3.

(4) Structural plate drainage structures shall conform to the following specifications: Corrugated aluminum alloy structural plate pipe, pipe arches and arches shall consist of aluminum plates and galvanized bolts and nuts of the size, shape and thickness as shown on the approved plans. These structures shall conform to the requirements of AASHTO M-219.

(5) Smooth Interior Corrugated Polyethylene Pipe

(a) This specification applies to high density polyethylene corrugated pipe with an integrally formed smooth interior (PE). PE pipe manufacturers shall be approved by the City Engineering Department.

(b) This pipe shall conform to the requirements of AASHTO M-294 and AASHTO MP7, Type S and D.

(c) Joints shall be as recommended by the manufacturer and approved by the City. Connections shall create a soil tight joint at a minimum and shall use a rubber gasket, which conforms to ASTM F-477.

(d) Installation shall be in accordance with ASTM Recommended Practice D- 2321, AASHTO Section 30.

(6) Certification from the manufacturer that the product was manufactured, tested, and supplied in accordance with this specification shall be furnished to the City upon request.

(7) Additional Pipe Material Specifications:

(a) From the CSP Durability Guide, the recommended environmental ranges for aluminized Type 2 CSP are as follows:

$$5 \leq \text{pH} \leq 9$$

$$\text{Soil Resistivity} \geq 1,500 \text{ ohm-cm}$$

$$\text{Maximum design velocity} = 15 \text{ fps}$$

(b) The averages for pH and soil resistivity are:

$$\text{pH} = 5.4$$

$$\text{Soil Resistivity} = 13,070$$

(c) Granular backfill will provide a more neutral pH and resistivity of 10,000-30,000.

(d) From CSPI handbook (chapter 7, pg. 325), "...backfill material should preferably be granular to provide good performance."

(e) Bedding detail was developed assuming poor soil conditions so that optimal pipe performance could be realized. Flexible pipe such as metal and plastic are more susceptible to backfill conditions than rigid pipe such as RCP.

14.2.1.3 Pipe Installation

- (1) Reinforced concrete pipe, corrugated aluminum alloy pipe, corrugated aluminum coated steel pipe and smooth interior corrugated polyethylene pipe shall be installed in accordance with Section 550 of the Georgia DOT Standard Specifications, Construction of Roads and Bridges. Prior to approval of a Final Plat, the City may require the submittal of certification from a mandrel testing agency indicating that all installed pipe does not exceed 5% deflection. Based on field inspections, video surveillance may be conducted by the City or required by the City on storm drain installations before approval of the Final Plat or issuance of the Certificate of Occupancy. If required, video surveillance should be done after completion of all activities that may damage the pipe but prior to placement of base, paving or landscaping over or near the pipe. If video surveillance indicates problems such as pipe deformation, cracking or joint separation, the pipe shall be removed and replaced before approval.
- (2) Bedding. All pipe structures shall be placed on stable earth or fine granular foundation, the characteristics of which would be expected to provide long-term stability. In all live stream pipe installations, in areas of low bearing capacity soils or non-uniform foundations, in area where rock is encountered at the foundation level, or in other locations where conditions warrant, a minimum of 6" of crushed stone bedding is required, (maximum size of stone shall be 3/4"). Geotextiles or geogrids may also be required by the City in problem areas.
- (3) Backfilling. Backfill on all pipe installations shall be constructed using foundation backfill material Type I or Type II, as specified in Section 812.01 and 812.02 respectively, in Georgia DOT Standard Specifications. These materials shall be placed in layers of not more than six inches loose. Compaction of these materials shall be accomplished by hand tamping or machine tamping. Required compaction levels are as follows:
 - (a) Backfill within all street rights-of-way shall be compacted to 95% maximum density, tested using the AASHTO Method T-99.
 - (b) Backfill in all other areas shall be compacted to 85% maximum density, tested using the AASHTO Method T-99.
- (4) Construction loads and minimum covers. If drainage pipe is installed prior to the completion of grading, a minimum of 4 feet of fill should be provided where needed to adequately protect the drainage structure during the land development phase, unless the structure itself is designed to withstand the anticipated live load during construction.

14.2.1.4 End Finish

- (1) Headwalls or other end treatments are required on all culverts (except under residential driveways) and at the outlet of all piped collection systems.
- (2) Headwalls are to be precast concrete, stone masonry with reinforced concrete footings, or poured-in place, reinforced concrete with reinforced concrete footings. Precast concrete headwalls for corrugated aluminum coated steel pipe

or aluminum alloy pipe shall be made with aluminum coated steel or aluminum alloy pipe stubs.

- (3) End treatments that conform to the slope may be pre-cast concrete end sections, aluminum coated steel or aluminum alloy end sections, masonry, PE end sections, reinforced poured-in-place slope collars, or grouted rip-rap. Concrete and metal flared end sections shall conform to Georgia DOT Standard Drawing 1120.

14.2.1.5 Junction Boxes and Catch Basins

- (1) Junction boxes and catch basins shall have metal manhole frames and lids for access.
- (2) Lids for storm drainage facilities shall be engraved as follows: Storm Sewer City of Lawrenceville with the image of a fish in the center of the lid.

14.2.1.6 Other Structures

Natural bottom arches and box culverts may be used in accordance with the latest Standard Specifications of the Georgia Department of Transportation.