

GWINNETT COUNTY

STORM SEWER PIPE STANDARDS

1.0 Standard Specifications

- 1.1 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).
- 1.2 Allowable pipe material for all 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), 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.
- 1.3 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 Gwinnett Department of Transportation.
- 1.4 Only Reinforced Concrete Pipe (RCP) shall be used for all dams unless the Georgia Safe Dams Program requires another material. Only RCP shall be used for pipes carrying live streams.
- 1.5 The Director of the Department of Water Resources (GCDWR) or their designee may approve a variance for use of an alternative pipe material.

2.0 Minimum Pipe and Pipe Coating Requirements

- 2.1 The type of pipe material used shall be in accordance with section 1.0 herein.
- 2.2 Reinforced concrete pipe shall be manufactured 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 Georgia DOT Standard 1030-D, Table No.1.
- 2.3 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 and AASHTO M-197. Polymer precoat steel pipe shall comply with AASHTO M-245 and AASHTO M-246.

- 2.3.1 See Georgia DOT Standard 1030-D, Tables 1 and 1R for the minimum acceptable combinations of gages, diameters, and corrugation configurations for corrugated aluminum alloy pipe and pipe arches, and for corrugated aluminum coated steel pipe and pipe arches. However, the minimum pipe thickness shall be 14 gage.
- 2.3.2 The following environmental ranges shall be allowed for aluminized Type 2 CSP:
- i. $4.5 \leq \text{pH} < 5.0$ with Soil Resistivity $> 5,000$ ohm-cm
 - ii. $5.0 \leq \text{pH} \leq 9.0$ with Soil Resistivity $\geq 1,500$ ohm-cm

If the NRCS Soil Survey of Gwinnett County shows a potential for soils with a $\text{pH} \leq 5$ anywhere on the site, GCDWR may require pH and soil resistivity testing. If required, tests are to be completed by an independent testing firm at the Contractor/Developer's expense. All testing to be in accordance with ASTM G51 for pH and ASTM G57 for soil resistivity.

- 2.3.3 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 9, and AASHTO M-36, Section 9, respectively.
- 2.3.4 Gaskets may be required as determined by the County 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 9.5.
- 2.4 Structural plate drainage structures shall be designed by a Registered Professional Engineer in Georgia and conform to the requirements of AASHTO M-219.
- 2.5 Smooth Interior Corrugated High Density Polyethylene Pipe
- 2.5.1 High density polyethylene pipe shall be corrugated with an integrally formed smooth interior (HDPE).
- 2.5.2 This pipe shall conform to the requirements of AASHTO M-294, Type S.
- 2.5.3 Joints shall be as recommended by the manufacturer and approved by the

County. Connections shall create a soil tight joint at a minimum and shall use a rubber gasket, which conforms to ASTM F-477.

- 2.5.4 Installation shall be in accordance with GDOT Standard Detail 1030P. The internal diameter of the barrel shall not be reduced by more than 5% of its base inside diameter when measured not less than 30 days following completion of installation.
- 2.6 Certification from the manufacturer that the product was manufactured, tested, and supplied in accordance with this specification shall be furnished to the County upon request.

Table 1 Pipe Materials

Pipe Type		Reinforced Concrete Pipe	Metal Pipe			Plastic Pipe	
			Aluminized Type 2 Steel	Polymer Precoat Steel	Aluminum Alloy	Corrugated Polyethylene	Smoothed Lined High Density Polyethylene Type "S"
Specifications (See Note 1)		ASTM C76, AASHTO M170	ASTM A760, A929; AASHTO M36, M274	ASTM A742, A762; AASHTO M245, M246	ASTM B744, B745; AASHTO M196, M197	AASHTO M252	ASTM F-2306; AASHTO M294
Minimum Thickness / Class		III	14 Ga.	14 Ga.	14 Ga.	AASHTO M252	AASHTO M294
Installation Type							
Longitudinal		X	X	X	X		X
Public Road ADT <5000	Cross Drain < 10% Slope	X	X	X	X		X
	Cross Drain > 10% Slope			X			X
Public Road ADT ≥5000	Cross Drain < 10% Slope	X					X (See Note 2)
	Cross Drain > 10% Slope			X			X (See note 2)
Lateral Systems		X	X	X	X		X
Slope Drain			X	X	X		X
Perforated Underdrain			X	X	X	X	X
Dams		X					
Perennial Streams		X					
Minimum Allowable Design Velocity		2.5 fps	2.5 fps	2.5 fps	2.5 fps	- -	2.5 fps
Maximum Allowable Design Velocity		15 fps	15 fps	15 fps	15 fps	- -	15 fps
Notes: 1.) All pipe materials shall meet the minimum requirements of the Georgia Department of Transportation's Standard Specifications for Construction of Transportation Systems, most current edition. 2.) HDPE not allowed on roads with ADT ≥15,000.							

3.0 Pipe Installation

- 3.1 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 Transportation Systems.

3.2 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 solid 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 County in problem areas.

3.3 Backfill

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 Construction of Transportation Systems. 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:

- 3.3.1 Backfill within all street rights-of-way shall be compacted to 95% maximum density, tested using the AASHTO Method T-99 or ASTM D-698.
- 3.3.2 Backfill in all other areas shall be compacted to 85% maximum density, tested using the AASHTO Method T-99 or ASTM D-698.

3.4 Bedding and Backfill Detail

Trench construction, bedding and backfill shall be in accordance with Georgia DOT Standard 1030-D for RCP and metal pipes and 1030-P for HDPE. HDPE not installed under pavement of County-maintained roads may follow the bedding requirements for Side Drain (Driveway) Installations shown on Georgia DOT Standard 1030-P.

3.5 Inspection and Testing

- 3.5.1 The GCDWR Inspector will make periodic job site visitations without advance notice to the Contractor. However, it is the responsibility of the Contractor to contact the Inspector during each phase of the installation for

inspections and or re-inspections.

- 3.5.2 Compaction testing shall be completed by an approved independent geotechnical firm listed on the Gwinnett County Authorized Geotechnical Testing Firms list at the Contractor/Developer's expense. The contractor must maintain a geotechnical engineer on-site during all storm sewer pipe installation to ensure proper compaction and backfill. The frequency of testing shall be a minimum of one test per 500 cubic yards of material placed, or one test per section of pipe from structure to structure. Each compaction test will include testing of each 8-inch lift to final grade. Copies of compaction tests shall be made available to Gwinnett County Department of Water Resources prior to approval of as-built drawings.

3.6 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.

4.0 End Finish

- 4.1 Headwalls or other end treatments are required on all culverts (except under residential driveways) and at the outlet of all piped collection systems.
 - 4.1.1 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.
 - 4.1.2 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.

5.0 Junction Boxes and Catch Basins

- 5.1 Junction boxes and catch basins shall have metal manhole frames and lids for access. Ladder must line up with the manhole cover to ensure accessibility.
- 5.2 Lids for storm drainage facilities shall be engraved in accordance with the Gwinnett County Standard Drawings.
- 5.3 Manhole lids must be accessible and shall not be buried or paved over.

- 5.4 Maximum invert to invert drop in a stormwater manhole or junction box shall be 10 feet.

6.0 Other Structures

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

7.0 Final Acceptance

- 7.1 As-built Drawings must be submitted, reviewed and approved prior to approval of a Final Plat or issuance of a Certificate of Occupancy.
- 7.2 As-built Drawings must be drawn to scale, legible and suitable for scanning.
- 7.3 As-built drawings must include a site plan, profiles, and permanent easements and include any field changes not shown on the original approved plans.
- 7.4 As-built Drawings shall be sealed by a Georgia Registered Professional Engineer, Registered Land Surveyor or Registered Landscape Architect.
- 7.5 Upon final approval of As-built Drawings and construction inspections the Contractor/Developer may request Final Inspection. The Contractor/Developer shall allow up to 21 calendar days for Final Inspections after the project Final Inspection request is submitted by the GCDWR Inspector. In the event that GCDWR is unable to perform the Final Inspection within 21 calendar days, Contractor/Developer has the option to have CCTV inspection performed at Contractor's / Developer's expense by a firm listed on a Pre-Qualified CCTV Inspection Contractor list. Any defects discovered by GCDWR inspection of the CCTV recording must be corrected immediately in order to receive Final Inspection approval.
- 7.6 Final Inspection, including CCTV inspection shall be performed after completion of all activities that may damage the pipe but prior to placement of base, paving or landscaping over or near the pipe.
- 7.7 The Final Inspection will be performed by GCDWR at the Contractor/Developer's expense and kept by GCDWR records. Initial payment for Final Inspection fees shall be paid by the Developer or his assigns in advance at the time of project plan approval and at a rate as established by the GCDWR Director. Following any corrections of discrepancies, the lines and structures will be re-inspected. Additional fees, as determined by the GCDWR Director, will be assessed. These fees must be paid prior to the project being issued a "pass" Final Inspection report.
- 7.8 The requirements in GDOT 550.3.06.D, GDOT 550.3.06.E, or GDOT 550.3.06.F will be used to determine if the pipe is acceptable or if remediation or replacement must

be completed prior to approval of Final Plat or issuance of a Certificate of Occupancy.

8.0 Approved Contractors

The pipe contractor is required to be listed on the approved Utility Contractors List by GCDWR to install storm sewer pipe and structures. No contractor shall be allowed to commence installation of storm sewer pipe and structures until an application for inclusion to the Approved Utility Contractors List has been received and approved by GCDWR. Contractors will be required to re-apply once every four years to remain on the list. Previous performance and experience of the contractor will be considered in granting approval. Repeated failure to follow standards may result in removal or suspension from the Utility Contractor List.

Section 8.0 shall become effective 90 days after this specification is approved by the Board of Commissioners.