

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: November 10, 2015

Special Provision No. 12-1655

EFFECTIVE DATE: March 1, 2016

SUBJECT: Roadway Pipe Culverts.

Alabama Standard Specifications, 2012 Edition, SECTION 530 and SECTION 846 shall be revised as follows:

SECTION 530 ROADWAY PIPE CULVERTS

530.03 Construction Requirements.

(c) Pipe Bedding.

5. Class C-1 Bedding.

Item 530.03(c)5 shall be deleted from the Standard Specifications.

(d) Placing Pipe.

3. Joining Pipe.

a. Rigid Pipe (Concrete, C.I.)

Subitem 530.03(d)3a shall be replaced with the following:

a. Rigid Pipe (Concrete, C.I.)

Rigid pipe may be of bell and spigot, tongue and groove, or other approved design unless a specific type is specified. The method of joining pipe sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even.

Joints shall be sealed with bituminous plastic cement, preformed flexible sealant, rubber gaskets, or other type sealers that may be approved. Joints shall be thoroughly cleaned before being sealed and shall be sealed for the full circumference of the joint unless otherwise directed.

When joining round R.C. pipe, only rubber gaskets shall be used unless otherwise approved by the Engineer.

When bituminous plastic cement is used, the interior surface of the hub, beginning at the lip of the normal interior surface of the pipe, shall be coated with a layer of sealing material that will cover at least 0.33 times the distance, measured along the surface of the hub, parallel to the normal length of the pipe. The thickness of the mastic placed shall be such that it will provide a uniform seal between the edges of the pipe sections being joined (approximately 1/2 of an inch {10 mm} on the inside shoulder of the hub and approximately 1/8 of an inch {3 mm} of material on the remaining area to be covered).

When Pre-formed flexible sealant is used it shall be placed according to the manufacturers requirements.

No joint shall be considered satisfactory when the space between the edges of the pipes being joined exceeds 1/2 of an inch {10 mm} for more than 0.33 times the circumference of the pipe. The inside of the joint shall be wiped and finished smooth.

Rubber or other types of gaskets shall be installed as recommended by the manufacturer,

(e) Backfilling Pipe.

1. General.

Item 530.03(e)1 shall be replaced with the following:

1. General.

After the pipe has been installed, the pipe trench shall be backfilled with the best of the suitable material excavated from the trench; if none of this excavated material is suitable, material from the roadway shall be used and paid for as such, or suitable material shall be hauled in and used with payment being made under the classification of the material ordered used. For backfilling above a point 1 foot {300 mm} above the top of the pipe, material from the trench may be used unless unsuitable for embankment.

Backfilling will not be permitted until authorized by the **Engineer**.

2. Placing and Compaction of Backfill.

Item 530.03(e)2 shall be replaced with the following:

2. Placing and Compaction of Backfill.

The backfill material shall be compacted at near optimum moisture content, in layers not exceeding 6 inches {150 mm} compacted thickness, to a density of not less than 95 percent of AASHTO T 99 density by methods detailed in Section 210. Mechanical tampers shall be used unless another method of compaction is approved in writing; inundation or jetting will not be permitted unless specified on the plans. Care shall be exercised to thoroughly compact the backfill under the haunches of the pipe and to insure that the material is in intimate contact with the pipe. The backfill shall be brought up evenly in layers on both sides of the pipe for its full length until the trench is filled or up to subgrade elevation if the trench is in cut.

When the plans require stone or aggregate backfill, the material will be compacted (in layers not exceeding 6 inches) to the satisfaction of the Engineer. Mechanical tampers or vibrator plate compactors shall be used unless another method of compaction is approved in writing.

When the top of the pipe is exposed above the top of the trench, embankment material shall be placed and compacted for a width on each side of the pipe equal to at least twice the horizontal inside diameter of the pipe, or 12 feet {4 m} whichever is less. The embankment on each side of the pipe, for a distance equal to the horizontal inside diameter of the pipe, shall be of the same material and compacted in a normal **manner**. All pipe, after being bedded and backfilled as specified in this Section, should be protected by a 3 foot {0.6 m} cover of fill before heavy equipment is permitted to cross during construction of the roadway.

SECTION 846 PIPE CULVERT JOINT SEALERS

846.01 Rigid Pipes.

Article 846.01 shall be replaced by the following:

846.01 Rigid Pipes.

(a) General.

Allowable joint materials will be determined based on the shape of the pipe culvert as given in the table below.

Pipe Culvert Shape	Allowable Joint Materials
Round	Rubber Gasket
Arch, Horizontal Elliptical, and Precast Culverts	Rubber Gasket, Bituminous Plastic Cement, or Preformed Flexible Joint Sealant

Note: The joint sealing material requirements of this specification are provided to insure the installed pipe joints provide a soil tight performance. If a more stringent joint performance requirement is deemed necessary during the design phase, the Engineer may specify other materials or a different combination of materials specified above.

(b) Bituminous Plastic Cement.

Bituminous Plastic Cement meeting the Specifications noted in this Section may be used on joints for Arch and or Horizontal Elliptical Pipe and Precast box culverts.

This Specification covers a bituminous joint sealing compound which may be applied cold for sealing the joints of bell and spigot or tongue and groove storm or culvert pipe. Material furnished shall be composed of a steam-refined petroleum asphalt dissolved in a suitable solvent and stiffened with a mineral filler .

Properties: The Bituminous Plastic Cement shall be a smooth uniform mixture, not thickened or livered, and it shall show no separation which cannot be easily overcome by stirring. The material shall be of such consistency and properties that it can be readily applied with a trowel, putty knife, or caulking compound gun without pulling or drawing. When applied to the joint surfaces, it shall exhibit good adhesive and cohesive properties. The material shall meet the following requirements:

1. When applied in a layer 1/16 to 1/8 inch {1.5 mm to 3 mm} thick on a tinned metal panel and cured at room temperature for 24 hours, the Bituminous Plastic Cement shall set to a tough, plastic coating, free from blisters.		
	Minimum	Maximum
2. Grease Cone Penetration	175	250
3. Unit Weight {Unit Mass}, pounds per gallon {kilograms per liter}	9.75 {1.17}	-
4. Non-Volatile	70	-
5. Ash, by ignition, by weights {masses}	15	45
Tests: Methods of tests shall be in accordance with the following:		
Grease Cone Penetration	AASHTO T 187	
Non-Volatile	ASTM D 2939	
Ash	ASTM D 128	

(c) Preformed Flexible Joint Sealant

Preformed Flexible joint sealant meeting the requirements of this Section may be used on joints for Arch and or Horizontal Elliptical Pipe and Precast box culverts. This material shall meet the latest requirements of ASTM C990 “Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants”. The material shall be installed per the manufacturer’s recommendations.

(d) Rubber Gaskets.

Rubber gaskets shall be used on all round pipe joints. This material shall meet the latest requirements of ASTM C443 “Standard Specification for Joints for Concrete Pipe and Manholes Using Rubber Gaskets”. The material shall be installed per the manufacturer’s recommendations.

(e) Other Types of Joint Sealers.

External wrap joint sealant meeting the Specifications noted in this Section may be used in addition to and combination with joint material as specified in Subarticle (a) above. This material if or when used shall meet the latest requirements of ASTM C877 “Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections”. The material shall be installed per the manufacturer’s recommendations.

Other types of joint sealers or gaskets with proven satisfactory performance records may be considered by the Department for use on individual contracts on a trial basis.