

ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: March 4, 2015

Special Provision No. 12-1264

EFFECTIVE DATE: June 1, 2015

SUBJECT: Side Drain Pipe.

Alabama Standard Specifications, 2012 Edition, SECTION 535 and SECTION 851 shall be revised as follows:

SECTION 535 SIDE DRAIN PIPE

535.01 Description.

This Section shall cover the work of furnishing and installing side drain pipe in conformity with these specifications. The word "pipe" in this Section shall include both round and arch pipe. It shall cover only those pipes specifically designated on the plans as side drain; it shall not apply to other pipes laid parallel to the roadway. The kind, type, and size of each side drain pipe will be shown on the plans or in the proposal. The location of each will be shown on the plans or designated. This Section shall include furnishing and constructing such joints and necessary cutting to provide connections to other drainage facilities, and other incidentals necessary for completion of the work.

535.02 Materials.

(a) General

Materials furnished for use shall conform to the appropriate requirements of Division 800, Materials, with specific reference made to Sections 831, 846 and 851.

(b) Abbreviations:

Side Drain	SD
Concrete	PC for Plain Concrete Pipe RC for Reinforced Concrete Pipe
Vitrified Clay	VC
Corrugated Metal	CM for Plain Corrugated Metal CCM for Coated Corrugated Metal
Corrugated Aluminum	CA for Plain CCA for Coated
Corrugated Steel	CS for Plain CCS for Coated
Plastic	ABS for Acrylonitrile Butadiene Styrene HDPE for High Density Polyethylene PP for High Performance Polypropylene PVC for Polyvinyl Chloride

(c) Optional Types of Pipes.

Provided a specific type of pipe is not specified by the plans or proposal, the Contractor will be permitted to install any of the optional types of pipe herein. Substitutions will only be allowed with hydraulically equivalent pipes. The hydraulic equivalence of optional types of pipes will be shown on the plans. Optional types of pipe shall meet the following criteria:

- Diameters less than or equal to 24 inches {600 mm} - P.C.; V.C.; 16 gage {1.6 mm} C.M. with greater than or equal to 24 inches {600 mm} of cover, 14 gage {2.0 mm} CM with less than 24 inches {600 mm} cover; or P.V.C., A.B.S. or HDPE, or PP pipe (HDPE and PP up to 36 inches {900 mm} diameter) with minimum of 24 inches {600 mm} of cover, and maximum of 25 feet {7.5 m} fill height.
- Diameters greater than 24 inches {600 mm} - Class 2 R.C.; V.C.; 14 gage {2.0 mm} C.M.; P.V.C. or HDPE and PP (HDPE and PP up to 36 inch {900 mm} diameter) with a minimum of 24 inches {600 mm} of cover, and a maximum of 25 feet {7.5 m} fill height.

Higher strength and/or coated finish CM pipe when required will be noted in the pay item. The Contractor may, at his option, substitute a higher grade pipe than specified or, with written approval, a cast iron or ductile iron pipe meeting the appropriate requirements of Section 854, provided no additional cost is incurred by the Department for such substitution.

Any installation, once started, shall be completed using the same type of pipe unless specifically designated otherwise by plan details or requested and approved in writing.

535.03 Construction Requirements.

(a) General.

Construction details for installing side drain pipe shall be as specified in Section 530, except as modified in this Section.

The requirements of Subarticle 530.03(b) for partial construction of fills in advance of trenching will not apply. Trenches shall be excavated as specified in Section 214. No separate measurement or direct payment will be made for excavation and backfill of trenches for side drain pipes.

Special bedding will not be required; however, the pipe shall be bedded with ordinary care in the loosened soil foundation of the trench. Should the material at the elevation of the bottom of the pipe be ledge rock or other unsuitable bedding, it shall be excavated without additional compensation.

The pipe shall be installed so that it will not vary at any point more than 1 inch {25 mm} from established line and grade.

The pipe shall be backfilled in thoroughly compacted layers not more than 6 inches {150 mm} in thickness, using pneumatic tamps unless otherwise directed, but there will be no specific density requirements. Backfill shall be ordinary excavation material.

(b) Testing for Excessive Deformation in PVC, HDPE, and PP Pipe.

PVC, HDPE, and PP pipe shall be tested for excessive deformation. The test shall be performed by the Contractor in the presence of the Engineer. Testing shall be conducted no fewer than 30 days after the completion of the compaction of all fill over the pipe.

The Contractor shall conduct the test by pulling a nine point mandrel through the entire length of the pipe by hand.

The mandrel shall meet the following requirements:

- It shall be made of steel or aluminum;
- It shall have an effective diameter of 95 % of the nominal inside diameter of the pipe;
- It shall be at least as long as the diameter of the pipe;
- It shall be fitted with pulling rings at each end;
- It shall be stamped or engraved on some segment other than a runner with the pipe size and mandrel outside diameter.

Prior to testing, the Contractor shall provide the Engineer with a proving ring to verify the mandrel size.

The deformation is unacceptably excessive if the mandrel cannot be pulled through the pipe by hand without damaging the pipe. If the deformation is unacceptably excessive, the pipe shall be replaced without extra compensation. There will be no direct payment for testing.

535.04 Method of Measurement.

Side drain pipe will be measured in the same manner as specified in Article 530.04. Excavation and foundation backfill for side drain pipe will not be measured separately for payment, but the cost thereof shall be included in the contract unit price bid for the side drain pipe.

535.05 Basis of Payment.

(a) Unit Price Coverage.

Accepted side drain pipe, measured as specified above, will be paid for at the contract unit price per foot {meter} for the respective items, which shall be payment in full for furnishing pipe, excavating trenches, placing pipe, backfilling trenches, and for all tools, equipment, labor, and incidentals necessary to complete the work.

(b) Payment Will Be Made Under Item No.:

535-A ___ inch {mm} Side Drain Pipe (*) - per linear foot {meter}

535-B ___ inch {mm} Span, ___ inch {mm} Rise Side Drain Pipe (*) - per linear foot {meter}

* Show specific type, class, or wall thickness, if required.

Example: V.C., or P.C., or Class ___ R.C., or ___ gage {mm} C.A.,

or ___ gage {mm} C.S., or ___ gage {mm} C.C.S., or ___ gage {mm} C.C.A.

SECTION 851 SIDE DRAIN PIPE

851.01 Concrete Pipe.

(a) General.

Concrete pipe shall be reinforced circular or reinforced arch concrete pipe except that pipe 24 inches {600 mm} or less in diameter, and equivalent size arch pipe, may be plain concrete provided the pipe meets all other requirements of this Article.

(b) Special Design.

When so permitted by the plans or in the proposal, pipe of designs other than those shown in the standard plans may be permitted; however, such pipe must meet the performance and test requirements specified, for AASHTO M 170 and shall be installed under the same specifications as circular pipe.

(c) Classes of Pipe.

1. Plain Concrete Pipe (PC).

Only plain concrete pipe 24 inches {600 mm} or less in diameter (or equivalent area in arch pipe) will be permitted. Circular pipe shall meet the requirements for Class 2 pipe of AASHTO M 86 or for Class II of AASHTO M 170 without steel reinforcement, provided the same strength requirements for the same size pipe provided in AASHTO M 86 for Class II pipe are met. Arch pipe equivalent to a 24 inches {600 mm} diameter round pipe or less shall meet the requirements for Class A-II of AASHTO M206 without steel reinforcement provided the same strength requirements of the equivalent size circular pipe provided in AASHTO M86 for Class 2 pipe are met.

2. Reinforced Concrete Pipe (RC).

Circular pipe shall meet the requirements of AASHTO M 170 for the class of pipe designated by the plans.

Arch pipe shall meet the requirements of AASHTO M 206 for the class of pipe designated by the plans.

(d) Materials.

Coarse aggregate, fine aggregate, cement, steel reinforcement, and water shall meet the requirements of AASHTO M 170 or M 206, whichever is applicable except as modified in applicable Sections of Division 800, Materials.

(e) Tests.

All precast products furnished must meet the requirements of Section 831, Precast Concrete Products.

(f) Handling and Storage.

Handling and storage shall meet the requirements of Subarticle 850.01(f).

851.02 Corrugated Steel Pipe (CS).

CS used in the construction of side drain culverts shall be either circular or arch pipe meeting the requirements of Article 850.02, except that most side drain pipe may use plain galvanized steel pipe.

851.03 Corrugated Aluminum Pipe (CA).

CA used in the construction of side drain culverts shall be either circular or arch pipe meeting the requirements of Article 850.03.

851.04 Vitrified Clay Pipe (VC).

(a) General.

VC used in the construction of side drain culverts shall meet the requirements of AASHTO M 65 or ASTM C 700 for Extra Strength pipe.

(b) Handling and Storage.

Handling and Storage shall meet the requirements of Subarticle 850.01(f).

851.05 Polyvinyl Chloride Pipe (PVC).

PVC shall meet one of the following specifications: ASTM D 2241, F 789, D 1785, D 2665, D 3034, D 2680, F 794, F 949, or F 679.

851.06 Acrylonitrile Butadiene Styrene Pipe (ABS).

ABS shall meet the requirements of ASTM D 2751 or D 2680.

851.07 High Density Polyethylene Pipe (HDPE).

HDPE shall meet the requirements of AASHTO M 294, Type S. **HDPE** shall be furnished from an approved producer. Approved producers are shown on List I-11, "Producers of High Density Polyethylene Pipe" in the Department's "Materials, Sources and Devices with Special Acceptance Requirements" manual. Information concerning this list is given in Subarticle 106.01(f).

851.08 High Performance Polypropylene Pipe (PP).

PP shall meet the requirements of AASHTO M 330. **PP** shall be furnished from an approved producer. Approved producers are shown on List I-14, "Producers of High Performance Polypropylene Pipe" in the Department's "Materials, Sources and Devices with Special Acceptance Requirements" manual. Information concerning this list is given in Subarticle 106.01(f).

851.09 Special Requirements.

The Specifications for all pipes, as covered by Articles 851.05, 851.06, 851.07, and 851.08 are amended to the effect that any of these materials are acceptable in any configuration which will meet the criteria listed below:

1. Pipe shall have a minimum pipe stiffness as shown in AASHTO M 294 for **HDPE**, **AASHTO M 304 for PVC**, **ASTM D 2751 for ABS**, and **AASHTO M 330 for PP** when tested in accordance with ASTM D 2412.
2. Fill heights will be restricted to 50 feet {15 m} maximum. Pipe cover shall be 12 inches {300 mm} minimum.
3. All joints shall be soil-tight.
4. Pipe ends shall be encased in accordance with Special **Drawing Number** HW-614-SP.