REGIONAL CONSTRUCTION STANDARDS

SIXTH EDITION

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Storm Sewer Joint Wrap - Section 302
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SECTION 302

DRAINAGE STRUCTURES

I. GENERAL

1.1. DESCRIPTION OF WORK

The Contractor shall furnish all labor, supervision, material (except as herein provided), tools, equipment, supplies, and services; and, shall perform all Work necessary for the installation and construction of pipe culverts, endwalls, box culverts, precast concrete and metal arches, storm drains, drop inlets, manholes, spring boxes, junction boxes, and intake boxes and removing and replacing existing structures in accordance with these specifications and in conformity to the lines and grades shown in the Contract Documents or as designated by the Owner.

1.2. MATERIALS

Materials shall be furnished by the Contractor in accordance with Section 200.

1.3. SUBMITTALS

A. Submittals shall be made by the Contractor in accordance with the procedures set forth in Section 105 and as described below.

B. The Contractor shall furnish copies of the manufacturer's specifications and details for cast in place installations indicated in the Contract Documents, Standard Details, and the VDOT *Road and Bridge Standards*, latest edition, listing specific materials proposed.

C. Submittal of designs for precast items included in the Contract Documents will not be required provided fabrication is in accordance with the VDOT *Road and Bridge Standards*, latest edition. Submittal of designs for precast structures on VDOT's approved list will not be required provided the Contractor submits a certification that the item will be fabricated in accordance with the pre-approved design Drawings.

D. The Contractor shall furnish the Owner with an affidavit stating that products to be installed on this project comply with specification requirements.

E. The "Acceptance Procedures for Aggregates" shall be in accordance with Section 200.

II. EXECUTION

2.1. PROCEDURES

A. Trenching, excavation, bedding and backfill operations shall be performed in accordance with the requirements of Section 303.

B. The Contractor shall execute the Work in accordance with the latest edition of the VDOT *Road and Bridge Specifications*, Section 302.03, Procedures, however, Post Installation Inspection of Storm Sewer Pipes and Culverts shall be performed in accordance with 302.2.1.C below. Any references to "Engineer" or VDOT personnel shall mean the "Owner". **When geotextile filter**

fabric is required to wrap joints of rigid pipe, the installation shall be in accordance with 302.2.1.E below.

C. Post Installation Inspection of Storm Sewer Pipes and Culverts

In addition to the visual inspection if performed by the Owner during the initial installation of storm sewer pipes and pipe culverts, a post installation visual/video camera inspection shall be conducted by the Contractor in accordance with the requirements of this specification and VDOT VTM 123 on all pipes identified in the Contract Documents as storm sewer pipe and a selected number of pipe culverts. For the purposes of this Section all pipe installations not identified in the Contract Documents as storm sewer pipe are considered pipe culverts. Post installation Inspections shall be performed on straight line and radial installations.

For pipe culverts, a minimum of one pipe installation for each size of each material type utilized on the project will be randomly selected by the Owner for inspection, however, in no case will the amount of pipe subject to inspection be less than ten percent of the total contract amount for the size and material type indicated. Where possible, for all installations in which the pipe or culvert's size, orientation, or location permit deflection to be easily visually identified, (as verified with the Owner) the Contractor may perform visual inspections in lieu of video inspections. If defects as described herein are noted during the inspection, the Owner may require additional pipe installations of that size and/or material be inspected. The Contractor shall coordinate and schedule all post installation inspections so that these are made in the presence of the Owner. The post installation inspection shall be performed no sooner than 30 days after completion of the pipe installation and placement of final cover (except for pavement structure). The Contractor shall issue a report detailing all issues or deficiencies noted during the inspection (including a remediation plan for each deficiency noted where applicable) no later than 5 days after completion of the inspection.

While the intent of this requirement is to perform the post installation inspection prior to paving, project scheduling may dictate that a particular site be paved before the end of the 30 day period. In such cases, a preliminary inspection of the pipe shall be made, prior to paving over it, to insure that the pipe has been properly installed and is performing well. Performing such a preliminary inspection prior to paving will not relieve the Contractor from the requirement to perform the post installation inspection after the 30 day period.

The Contractor's inspection report shall identify and address any of the following items observed during the post installation inspection including identifying any proposed remediation measures the Contractor plans to perform where applicable. Remediation measures may consist of repairing or replacing the defective pipe section(s) or a combination of the two where differing conditions exist within the same run of pipe. Where permitted as an option, remediation methods for the various installation defects shall be proposed by the Contractor, reviewed with the Owner and must have the Owner's approval prior to implementation of the corrective action. Remediation shall be the sole responsibility of the Contractor. Further, if remediation measures are shown to be necessary, any time associated with such measures shall be reflected in the impact to the Contractor's progress schedule (may take the form of a time impact analysis, where required by the scheduling requirements) and will not relieve the Contractor of his responsibilities to finish the work required by the contract within the contract time limits or form the basis for any claim of delay where such remediation measures are determined to be a result of the Contractor's fault, omission or negligence.

a. original diameter, the pipe shall be replaced by the Contractor at his expense to the satisfaction of the Owner

Remediation efforts and percentage of payment shall apply to the entire section(s) of the deflected pipe or culvert, joint to joint. The cost of the remedial measures (including removal and replacement of the pipe, if necessary) and the re-inspection of the remediated pipe necessitated as a result of the Contractor's negligence, omission or fault shall be the contractual and financial responsibility of the Contractor.

D. Cleaning

Upon completion, each pipe and structure shall be cleaned of silt, debris, and foreign matter and shall be kept clear of such accumulation until final acceptance.

E. **Joining rigid pipe:**

1. **The method of joining rigid pipe sections shall be such that ends are fully entered and inner surfaces are flush and even.**

2. **Joints shall be sealed with any one or combination of the following to form a leak-resistant joint; rubber, preformed plastic, mastic gaskets, and concrete pipe joint wrapping; or cold-applied pipe joint sealer wrapped with filter fabric.**

3. **Rubber ring gaskets shall be installed to form a flexible, leak-resistant seal.**

4. **The Contractor shall double wrap each pipe joint with non-woven geotextile fabric strip and attach the fabric to the pipe with a minimum of two (2) non-metallic straps. The width of the fabric strip shall be at least two (2) feet wide and centered over the joint. The fabric shall be laid transversely in the trench of each joint prior to laying pipe and shall be centered over the joint. The inside of all concrete pipes shall be mortared to the spring line of the pipe. When pipes enter structures, the inside of the pipe/structure joint shall be fully mortared.**

   Non-Woven geotextile filter fabric shall meet the following requirements:

   - **90 lbs. Tensile Strength (ASTM D4632),**
   - **50% Tensile Elongation (ASTM D4632)**
   - **250 lbs. CBR puncture (ASTM D6241),**
   - **40 lb. Trapezoidal Tear Strength (ASTM D4533),**
   - **70% UV resistance at 500 hours (ASTM D4355),**
   - **50 US Sieve Apparent Opening Size (AOS) (ASTM D4751),**
   - **150 gpm/ft^2 Water Flow Rate (ASTM D4491).**

   Acceptable non-woven geotextile product manufacturers are ACF Environmental 35, US Fabrics 90NW, or approved equal.

5. **Permissible construction tolerances between the proposed inverts as shown on the Drawings and the as-built condition:**

   a. Maximum deviation of any invert from plan grade: +/-0.05'.

b. Total deviation of both inverts at each end of a particular line: +/-0.08'.

c. Maximum slope deviation +/- 0.02% between any two points in the line from the plan slope.

d. The strictest of the above shall apply. Any lines not properly installed in compliance with the above shall be removed and reinstalled to the proper alignment and in accordance with all other specification requirements, by the Contractor at no additional expense to the Owner.

III. MEASUREMENT FOR PAYMENT

A. The cost of excavation, backfill, and disposal of surplus material for drop inlets, intake boxes, manholes both new and reconstructed, spring boxes, junction boxes, and base sections of pipe tee units used as drop inlets and manholes shall be included in the bid price for such items. No additional or separate payment will be made. In the event steps or invert shaping are required, the cost thereof shall also be included in the price for such items.

B. Bedding stone depth shall be 6-inches and shall be considered incidental to the pipe and structures.

C. Undercut excavation and the replacement of excavated undercut material shall be as specified in Section 303.

D. Pipe will be measured in linear feet of each size pipe and material type installed. Pipe will be measured through the fittings from center of the structure to center of structure or to the terminal end. When a partial section is required, the actual length of the partial section will be measured in place. Pipe shall be paid for at the contract unit price per linear foot, complete in place. Payment will include the cost of the following:

1. Backfilling, compacting, and compaction testing
2. Bedding
3. Cleaning prior to acceptance, as required
4. Dewatering
5. Disposal of surplus material
6. Excavation
7. Joint Wrapping & Sealing, including geotextile fabric
8. Main line fittings
9. Pipe anchor blocks
10. Restoration in right-of-way and shoulders and easements (including curb and gutter restoration), unless otherwise specified in the Contract Documents.
11. Storm sewer and appurtenances
12. Stripping and stockpiling topsoil
13. Temporary seeding and stabilization
14. Temporary sheeting and bracing.

E. Pipe culverts will be measured and paid in linear feet. Pipe will be measured through the fittings from center of the structure to center of structure or to the terminal end. When a partial section is required, the actual length of the partial section will be measured in place.

F. Pipe tees and elbows will not be measured separately**.**