

715-R-732 PIPE CULVERTS, AND STORM AND SANITARY SEWERS

(Revised 07-15-21)

The Standard Specifications are revised as follows:

SECTION 715, BEGIN LINE 24, DELETE AND INSERT AS FOLLOWS:

Materials shall be in accordance with the following:

B Borrow	211904.06*
Concrete.....	702
Flowable Backfill.....	213
Geotextiles	918.02
Pipe Joint Sealant.....	907.11
Reinforcing Bars	910.01
Rubber Type Gaskets	907.13
Straps, Hook Bolts, and Nuts.....	908.12
Structure Backfill	904

** B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level.*

The maximum particle size of backfill material for corrugated pipe shall be less than 1/2 the corrugation depth.

SECTION 715, BEGIN LINE 334, DELETE AND INSERT AS FOLLOWS:

715.09 Backfilling

All pipe trenches shall be backfilled with structure backfill ~~or flowable backfill~~. Structure backfill shall be placed in accordance with 211. ~~Flowable backfill shall be placed in accordance with 213.07 as shown on the plans or as directed.~~ Structure backfill nominal sizes 2 in. and 1 1/2 in. shall not be used as pipe backfill on any pipe with exterior ribs, corrugations, or other profile.

If a pipe is to be backfilled using one of the flowable backfill options, design calculations shall be submitted in accordance with 105.02, either proving the pipe will not float or detailing the methods to be taken to prevent the pipe from floating during installation of the flowable backfill. Prior to placing one of the flowable backfill options for structure backfill, all standing water shall be removed from the trench. If the water cannot be removed from the trench, one of the non-flowable structure backfill options shall be used in lieu of flowable to backfill to an elevation 2 ft above the groundwater. The remainder of the trench shall be backfilled as shown on the plans.

Where material other than structure backfill is allowed and used for backfilling, it shall be of such nature that compacts readily. The portion around and for 6 in. above the top of the pipe shall be free from large stones. The material shall be placed in layers not exceeding 6 in. loose measurement, and each layer shall be compacted thoroughly by means of mechanical tamps.

Whenever a fine aggregate or dense graded backfill is placed on top of a coarse graded backfill, geotextile, in accordance with 918.02(a), Type 2A shall be used between the different backfill materials.

Backfill for slotted drain pipe and slotted vane drain pipe shall consist of class A concrete on both sides of the pipe. During the backfilling and paving operations, the slot shall be covered to prevent infiltration of material into the pipe.

All pipes, except underdrains, will be visually inspected for acceptance a minimum of 30 days after the completion of backfill operations. Pipes that cannot be visually inspected shall be video inspected for acceptance using equipment in accordance with 718.07. The Engineer will determine the sections of pipe to be video inspected.

For pipes that were video inspected, a copy of the video inspection shall be provided in a format acceptable to the Engineer. The video inspection shall be provided prior to performing the mandrel testing or if mandrel testing is not required, prior to acceptance of the pipe.

Type 3 pipes in accordance with 715.02(c) are excluded from the mandrel testing and video inspection requirements.

For pipe not requiring mandrel testing that is determined to be unacceptable by the Engineer, the unacceptable pipe shall be replaced between the nearest pipe joints or to the nearest structure, or a remediation plan shall be prepared by a professional engineer and submitted to the Engineer for final determination.

After the visual or video inspection, the Contractor shall check pipe deflection by performing a mandrel test as directed on pipes manufactured from materials listed in the following table. The Engineer will determine the runs of pipe installations to be mandrel tested with a minimum of 10% of the total length of each material to be inspected.

Pipes Required ing to Be Mandrel Tested ing	
Pipe Material	Standard Specifications
Corrugated Polyethylene Pipe*	907.17(b)
Corrugated Polypropylene Pipe	907.19
Profile Wall Polyethylene Pipe	907.20
Smooth Wall Polyethylene Pipe	907.21
Profile Wall PVC Pipe*	907.22
Smooth Wall PVC Pipe	907.23
* When used as underdrain pipe, mandrel testing will not be required.	

The mandrel shall have a minimum of nine arms or prongs and a diameter that is 95% of the nominal pipe diameter. The Contractor shall provide a proving ring that is 95% of the nominal pipe diameter for each mandrel.

The Contractor shall pull the mandrel through the pipe by hand. If the mandrel does not pass through the pipe, the Contractor shall measure and report the minimum diameter of the deficient pipe to the Engineer.

If the minimum diameter of the deficient pipe is between 92.5% and 95.0% of the nominal pipe diameter, the Contractor shall provide an evaluation of the deficient pipe prepared by a professional engineer. The evaluation shall consider the severity of the deflection and its effects on structural integrity, environmental conditions, and the design service life of the pipe. A report summarizing the evaluation and including the professional engineer's recommendation for acceptance, remediation, or replacement of the pipe shall be submitted to the Engineer for final determination.

If the minimum diameter of the deficient pipe is equal to or less than 92.5% of the nominal pipe diameter, the deficient pipe shall either be replaced or a remediation plan shall be prepared by a professional engineer and submitted to the Engineer for final determination.

The deficient pipe shall be replaced if the professional engineer's remediation plan recommends replacement of the pipe or if the pipe has been damaged.

Deficient pipe shall at a minimum be replaced between the nearest pipe joints or to the nearest structure. Replaced or remediated pipe sections shall be mandrel tested a minimum of 30 days after the completion of backfill operations.

~~Commercial and private drive pipes are excluded from the mandrel testing and video inspection requirements.~~

~~Where material other than structure backfill or flowable backfill is allowed and used for backfilling, it shall be of such nature that compacts readily. That portion around and for 6 in. above the top of the pipe shall be free from large stones. This material shall be placed in layers not to exceed 6 in., loose measurement, and each layer compacted thoroughly by means of mechanical tamps. Where coarse aggregate is used for structure backfill, geotextile shall be installed.~~

~~An adequate earth cover, as shown on the plans, shall be placed over the structure before heavy equipment is operated over it.~~

~~Backfill for slotted drain pipe and slotted vane drain pipe shall consist of class A concrete on both sides of the pipe. During the backfilling and paving operations, the slot shall be covered to prevent infiltration of material into the pipe.~~

SECTION 715, BEGIN LINE 529, DELETE AND INSERT AS FOLLOWS:

Video inspection for pipe will be measured by the linear foot as determined by the electronic equipment.

Geotextile used to wrap for backfill material will not be measured for payment.

SECTION 715, BEGIN LINE 667, DELETE AND INSERT AS FOLLOWS:

The cost of concrete, grating, pipe tubing, reinforcing bars, aggregate leveling bed, hardware cloth, and necessary incidentals, for construction of grated box end sections will be included in the cost of the grated box end section.

Geotextile required for coarse aggregate to be placed on top of the structure backfill

material will not be paid for separately. The cost of the geotextile shall be included in the cost of the structure backfill.

The cost of providing video inspection equipment, technician, and a copy of the video inspection shall be included in the cost of video inspection for pipe.
