

SECTION 6000 – STORM SEWERS

6001 SCOPE. This section covers storm sewer pipe embedment, pipe installation, and other appurtenant work.

6002 REFERENCES. Trenching, backfill and flowable fill shall conform to the requirements of Section 1100 - *Grading*.

6003 MATERIALS

A. Bedding. Granular bedding material shall meet the requirements for SB-2 or CA-5 aggregate as specified in Division 1100 of the KDOT specifications. Recycled concrete may be approved if material meets the required gradation and is free of debris.

B. Reinforced Concrete Pipe.

1. Reinforced concrete pipe shall conform to the following ASTM Standards and be of the minimum strength designated herein or such higher strength as may be required by the Contract Drawings or Special Provisions:

- a. Round Pipe: ASTM C 76, Class III, Wall B.
- b. Elliptical Pipe: ASTM C 507, Class HE-III.
- c. Arch Culvert Pipe: ASTM C 506, Class A-III.

2. Joints

- a. Flexible Gasket: Flexible gaskets may be either flat gaskets cemented to the pipe tongue or spigot, O-ring gaskets, or roll-on gaskets. All gaskets shall conform to ASTM C 443.
- b. Plastic Compound: This compound shall be a homogeneous blend of bituminous material, inert filler and suitable solvents or plasticizing compounds roughly mixed at the factory to a uniform consistency suitable for sealing joints of concrete pipe. The compound shall conform to the following requirements:

Bitumen, soluble in CS,	
Percent by weight, minimum	45%
Ash, percent by weight	15-50%
Penetration, standard cone, 15Og, 5 seconds, 2 5" C	
Trowel grade, bulk type	11 O-250mm
Extruded rope or flat tape type	50-120mm

The above penetration ranges include test tolerances.

- c. Preformed Plastic Compound: This compound shall be either rope form or flat tape form conforming to ASTM C 990. Primer,

as recommended by the manufacturer, shall be used to maintain the material in position while pipe sections are being joined.

- C. Corrugated Steel Pipe. Pipe and coupling bands shall conform to the requirements of ASTM A 760/A 760M. Bituminous and/or other coatings shall be provided when required by the Special Provisions. All helical pipe shall have circumferential re-corrugated ends with a minimum of 4 re-corrugations on each pipe. Bituminous coating, if specified, shall conform to AASHTO M-190. Minimum thickness of the metal after galvanizing shall be as follows:

Circular Pipe					
2-2/3" x 1/2" corrugations			3" x 1" or 5" x 1" corrugations		
	Minimum			Minimum	
Diameter	Thickness	Gauge	Diameter	Thickness	Gauge
(in.)	(in.)		(in.)	(in.)	
12-21"	0.079	14	36-54"	0.079	14
24-30"	0.079	14	60-84"	0.109	12
36-54"	0.109	12			
60-72"	0.138	10			
84"	0.168	8			

Arch Pipe				
2-2/3" x 1/2" corrugations				
Equivalent	Minimum			
Diameter	Thickness	Gauge	Span*	Rise*
(in.)	(in.)		(in.)	(in.)
15"	0.064	16	17"	13"
18"	0.064	16	21"	15"
21"	0.064	16	24"	18"
24"	0.079	14	28"	20"
30"	0.079	14	35"	24"
36"	0.109	12	42"	29"
42"	0.109	12	49"	33"
48"	0.109	12	57"	38"
54"	0.109	12	64"	43"
60"	0.138	10	71"	47"
* Subject to manufacturing tolerances				

D. High Density Polyethylene (HDPE) Pipe

1. High density polyethylene pipe shall conform to AASHTO M294, type S (non-perforated circular cross section with corrugated outer surface and a smooth inner surface) for pipe diameters of 15 inches to 60 inches, inclusive.
2. Joints may be either bell and spigot, gasketed joints or made with external coupling bands. Joint integrity shall conform to the performance requirements of AASHTO M294.
3. Fittings and coupling bands shall be fabricated from the same material as the pipe and conform to AASHTO M294.
4. Coupling bands shall cover at least two full corrugations on each section of pipe and shall prevent the infiltration of soil into the pipe.

6004 INSTALLATION

- A. Trenching. Excavation, grading, trenching, backfilling, compaction and density testing shall conform to requirements of Section 1100 of these Specifications.
- B. Handling. All pipe and appurtenances shall be protected during installation from cracking, chipping, breaking, bending or other damage to pipe or coating materials. Damaged pipe materials shall be replaced with new materials unless otherwise approved by the Engineer.
- C. Alignment And Grade. The alignment and grade or elevation of each pipe and appurtenant structure shall be maintained as shown on the drawings.
- D. Laying. The laying of pipe in prepared trenches shall commence at the lowest point and continue upstream. Pipe shall be laid carefully centered to form a uniform flow line.
- E. Pipe Bedding. Granular bedding material shall be spread and the surface graded to provide a uniform and continuous support beneath the pipe at all points between bell holes or pipe joints.

Bedding shall be placed on each side of the pipe to the elevations indicated on the standard details. Bedding shall be compacted as necessary to provide firm uniform support for the pipe, and not subject the pipe to settlement or displacement.

- F. Reinforced Concrete Pipe. Core holes and handling holes in concrete pipe shall be repaired by cementing a properly-shaped concrete plug in

place with epoxy cement or by other methods acceptable to the Engineer.

- G. Corrugated Steel Pipe. Before installing corrugated steel pipe, repair any damage to the metallic coating on the pipe. Clean the damaged area to bright metal by blast cleaning, power disk sanding or wire brushing. Apply zinc-rich paint over the cleaned area. Use zinc-rich paint to repair galvanized coatings.
- H. HDPE Pipe. HDPE pipe shall be installed in accordance with ASTM Recommended Practice D2321
- I. Structure Connections. Pipes connected to structures shall be cut parallel with the inside face of the structure for plane walls and parallel with the spring line of the pipe for curved walls. Projection of the pipe beyond the inside face shall not exceed six (6) inches (measured at the spring line for curved walls).
- J. Drainage Maintenance. Backfilling shall be performed so that water will not accumulate in unfilled or partially filled trenches. Surface drainage shall not be obstructed longer than necessary.
- K. Protection Of Trench Backfill. Where trenches are constructed in ditches or other water courses, backfill shall be protected from surface erosion. Erosion control methods shall comply with the approved Stormwater Pollution Prevention Plan (SWP3) or as approved by the Engineer.