

The logo for FRATCO, featuring the word "FRATCO" in a bold, white, italicized sans-serif font, centered within a red rounded rectangular background.

FRATCO

INSTALL GUIDE

Engineered Drainage for
Railway Applications

SmoothCorr Pipe | Dual-Wall | Polyethylene Pipe

SmoothCorr is a dual-wall pipe capable of high-capacity drainage. With a corrugated exterior for strength and a smooth interior wall for superb flow, this solution is suitable for almost any job, including highway, agricultural and municipal drain applications.

RESIN	SIZE	ASTM	AASHTO
V Series	3" - 10"	F667	M252
	12" - 60"	F2306	M294

SmoothCorr Pipe (per AASHTO) Specification

Scope

This specification describes 4"-60" (100 to 1500 mm) SmoothCorr pipe for use in gravity-flow drainage applications under E-80 Loading Railroad Applications.

Pipe Requirements

SmoothCorr through 60-inch (100 to 1500 mm)

- 4"-10" (100 to 250 mm) per AASHTO M252, Type S pipe.
- 12"-60" (300 to 1500 mm) per ASTM F2306 and AASHTO M294, Type S pipe.
- Manning's roughness coefficient "n" value in design shall be 0.012.

Joint Performance

Soil-tight (ST IB) pipe shall be joined using a bell and spigot joint. The bell and spigot joint shall meet the soil-tight requirements of ASTM F2306 and gaskets shall meet the requirements of ASTM F477.

Plain End pipe and fittings connections shall be joined with coupling bands covering at least two full corrugations on each end of the pipe. Gasketed soil-tight coupling band connections shall incorporate a closed-cell synthetic expanded rubber gasket meeting the requirements of ASTM D1056 Grade 2A2. Gaskets, when applicable, shall be installed by the pipe manufacturer.

Watertight (WT IB) pipe shall be joined using a bell and spigot joint. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. 12"-60" (200 to 1500 mm) diameters shall have a bell reinforced with a polymer composite band. The bell tolerance device shall be installed by the manufacturer.

Fitting connections shall be with a bell and spigot connection utilizing a welded bell and valley gasket. The joint shall meet the watertight requirements of ASTM D3212, and gaskets shall meet the requirements of ASTM F477. If jointing a fitting to standard inline bell/spigot (IB) pipe, the bell or spigot may need to be cut off to enable proper connection.

All joints under track shall be wrapped with a minimum 12 ounce non-woven geotextile to prevent migration of fines through the joint in the event of improper joint connection, unless the pipe is backfilled with a fabric-wrapped, opengraded stone backfill.

Fittings

Fittings shall conform to ASTM F2306 and meet joint performance indicated above for fitting connections. Custom fittings are available and may require special installation criterion.

Installation

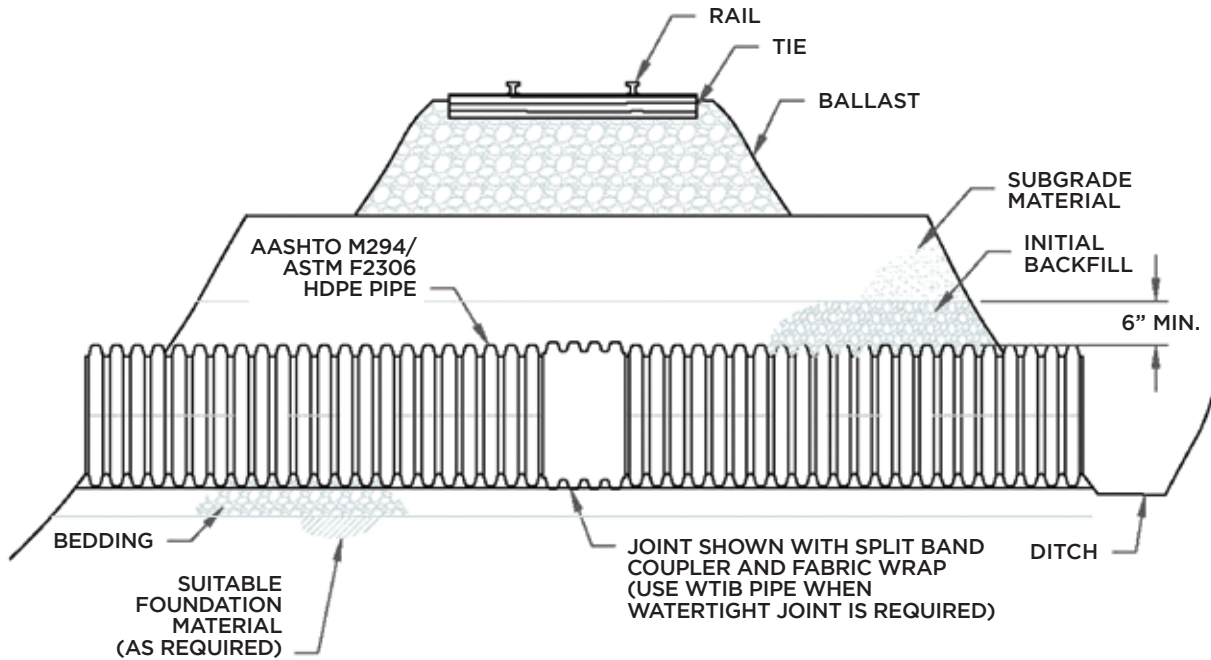
Installation shall be in accordance with ASTM D2321 installation guidelines, with the following exceptions.

Minimum cover from bottom of tie to top of pipe for 4"-24" (100 to 600 mm) diameters shall be 2' (0.6 m) for 30"-36" (750-900 mm) diameters shall be 3' (0.9 m) and for 42"-60" (1050 to 1500 mm) diameters, the minimum cover shall be 4' (1.2 m) in single run applications.

Backfill and compaction for under track applications shall consist of ASTM D2321 standard backfill materials as follows: Class 1 backfill compacted, and Class 2 (minimum 95% SPD).

Material must be adequately “knifed” into haunch and in between corrugations. Where migration of fines is possible with an open graded backfill a minimum 8 ounce nonwoven filter fabric should be wrapped around the backfill to act as a separator. Project soil particle size and durability requirements may require a change in filter fabric properties.

Maximum cover from bottom of tie to top of pipe for 4”-24” (100 to 600 mm) shall be 25’ when pipe is installed with Class 1 compacted backfill as pipe embedment material, and 20’ if Class 2 (minimum 95% SPD) backfill is used as pipe embedment material. Maximum cover from bottom of tie to top of pipe for 30”-60” (750 to 1500 mm) shall be 25’ when pipe is installed with Class 1 compacted backfill as pipe embedment material, and 15’ if Class 2 (minimum 95% SPD) backfill is used as pipe embedment (120 lbs/f³ [1926 kg/m³]) for overburden material.



NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. **FOUNDATION:** WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE UNSUITABLE MATERIAL TO THE REQUIRED DEPTH AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE DESIGN ENGINEER. DEPTH OF FOUNDATION IMPROVEMENT MAY BE REDUCED BY USE OF GEOTEXTILE FABRIC AND GRID. REQUIRED TRENCH WIDTH MAY INCREASE WHEN FOUNDATION MATERIAL IS MODIFIED.
4. **BEDDING:** SUITABLE MATERIAL SHALL BE ASTM D2321 CLASS 1 OR 2. MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 12"-24" (300mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm). THE MIDDLE THIRD OF THE BEDDING SHALL BE LOOSE AND UNIFORM IN DEPTH AND CONSISTENCY. AFTER PIPE IS IN PLACE, COMPACT BEDDING TO INITIAL BACKFILL STANDARDS.
5. **INITIAL BACKFILL:** SUITABLE MATERIAL SHALL BE ASTM D2321 CLASS 1 OR 2 UNLESS STATED OTHERWISE BY THE DESIGN ENGINEER. MINIMUM COMPACTION SHALL BE:

CLASS 1, COMPACT IN PLACE, 8" LOOSE LIFTS WITH JUMPING JACK OR SMALL VIBRATORY COMPACTOR
CLASS 2, COMPACT IN PLACE, 8" LOOSE LIFTS TO MIN. 95% STANDARD PROCTOR DENSITY
6. THE CONTRACTOR SHOULD PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATIONS TO DESIGN ENGINEER, WHERE BACKFILL VERIFICATION IS NOT PROVIDED OR WHERE BACKFILL MAY BECOME SATURATED AFTER PLACEMENT, ONLY ASTM CLASS 1 OR 2 (CLEAN) BEDDING AND BACKFILL SHOULD BE USED.
7. PRIOR TO FINAL COMPACTION EFFORT, WORK BACKFILL INTO HAUNCH ZONE BY SHOVELING IN PLACE AND DIAGONALLY WALKING (STOMPING) THE SOIL INTO THE HAUNCH ZONE. THIS EFFORT WILL MAKE COMPACTION MORE EFFECTIVE.

FRATCO HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICES FOR THE PROJECT, NOR HAS FRATCO INDEPENDENTLY VERIFIED THE INFORMATION SUPPLIED. THE INSTALLATION DETAIL PROVIDED HEREIN ARE GENERAL RECOMMENDATIONS AND ARE NOT SPECIFIC FOR THIS PROJECT. THE DESIGN ENGINEER SHALL REVIEW THESE DETAILS PRIOR TO CONSTRUCTION. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THE DETAILS PROVIDED HEREIN MEETS OR EXCEEDS THE APPLICABLE NATIONAL, STATE, OR LOCAL REQUIREMENTS AND TO ENSURE THAT THE DETAILS PROVIDED HEREIN ARE ACCEPTABLE FOR THIS PROJECT.

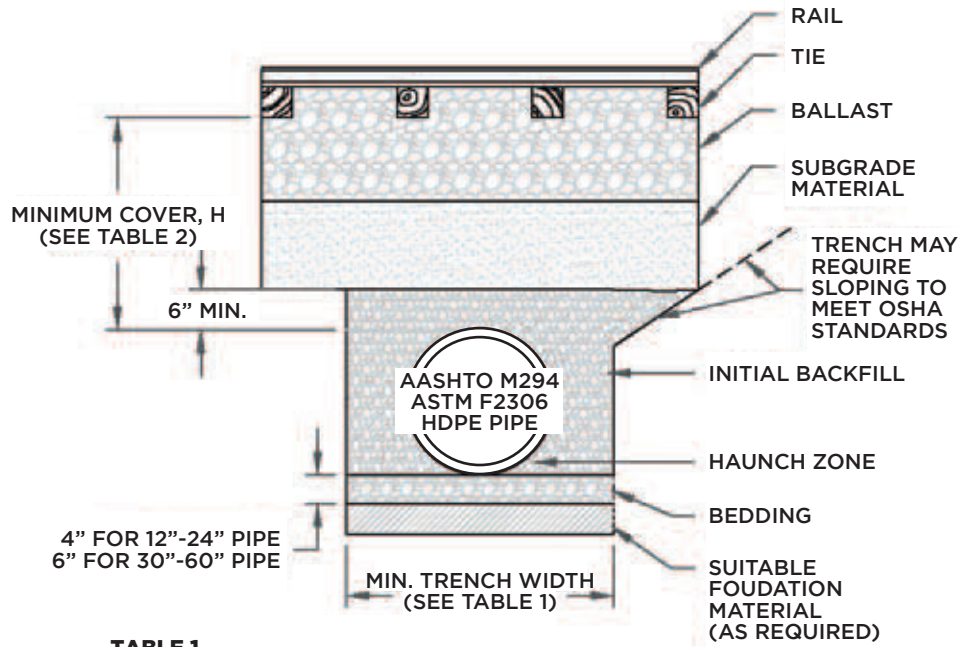


TABLE 1
RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
60"	96"

TABLE 2
MINIMUM RECOMMENDED COVER BASED ON RAILWAY LOADING CONDITIONS

PIPE DIAM.	COOPER E-80 ²
UP TO 24"	24"
30"-36"	36"
42"-60"	48"

1. COVER IS MEASURED FROM TOP OF THE PIPE TO BOTTOM OF RAILWAY TIE.
2. LOADS GREATER THAN E-80 LOAD MAY REQUIRE ADDITIONAL COVER.
3. MINIMUM COVER MAY BE INCREASED TO PREVENT PIPE DAMAGE DUE TO ROUTINE TRACK MAINTENANCE