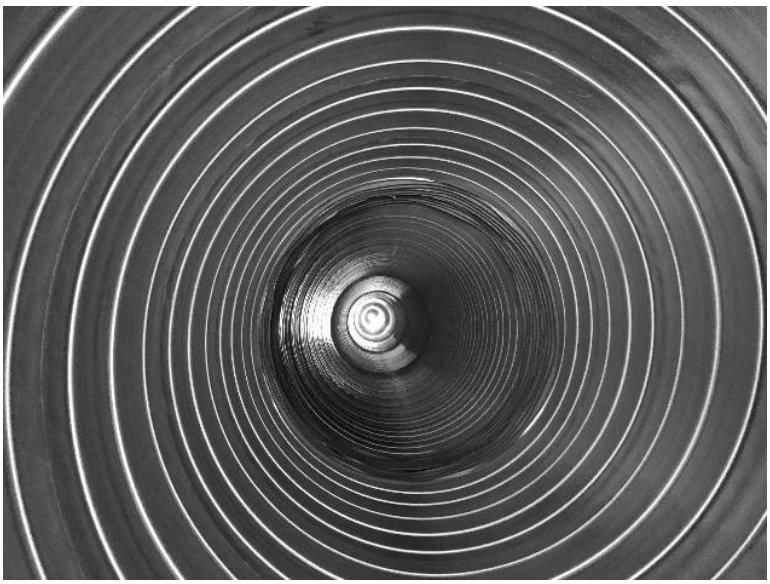
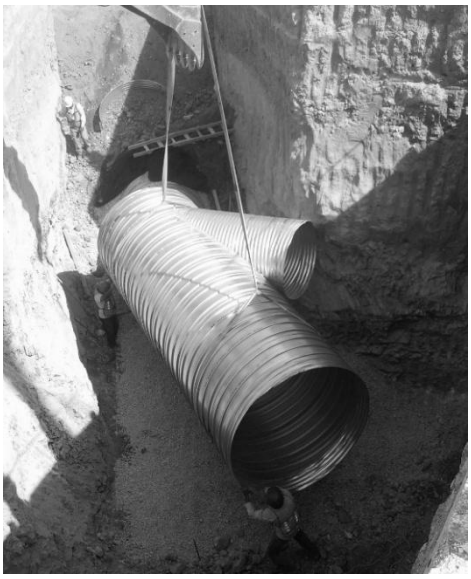
FLONIK® CORRUGATED PIPE PROPERTIES



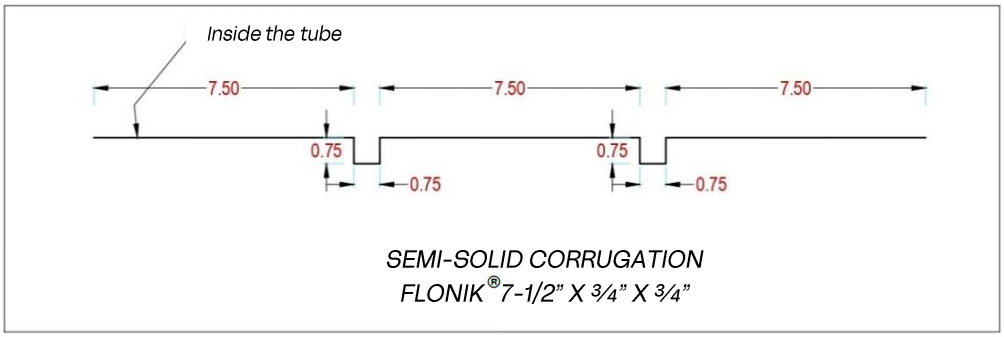


FLONIK® corrugated steel pipe is classified as a flexible pipe based on how it responds to external loads. In simple terms, its structural performance depends on soil-pipe interaction, making proper backfilling essential for load transfer and structural integrity—as outlined in AASHTO Section 12.

FLONIK® corrugated steel pipe is available with a wide range of protective coatings that have been proven to perform in the most demanding environments. With the appropriate coating, and tailored to the site and application, service life can exceed 100 years.

FLONIK® pipe is manufactured from galvanized or aluminized steel to ensure long-lasting durability.

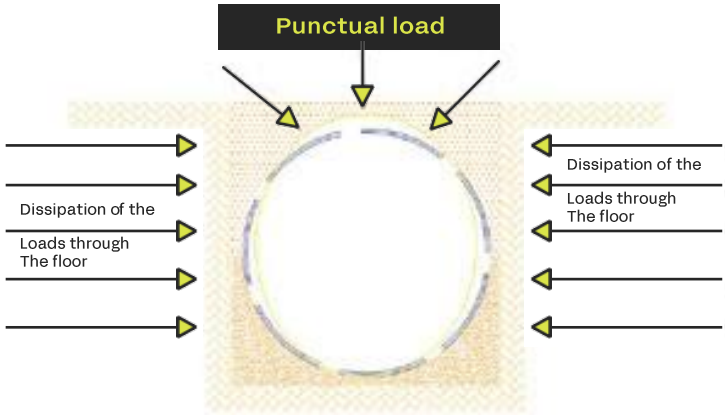
The pipe's semi-smooth corrugation provides a Manning's coefficient of 0.012, improving hydraulic performance in stormwater applications.



SEMI-SOLID CORRUGATION
FLONIK® 7-1/2" X ¾" X ¾"

Specification Table: Compliance with International Standards

Steel Coating	Galvanized > 2 oz/Ft2 Aluminized	ASTM 929 ASTM 929	AASHTO M218 AASHTO M274
Pipe		ASTM 760	AASHTO M36
Installation		ASTM 798	AASHTO Section 26
Desing		ASTM A796	AASHTO Section 12



The **structural capacity** of a corrugated pipe is determined by a combination of the following key factors:

- **Corrugation**

  Transverse waves running the length of the pipe form its structural body. Deeper, and more frequent corrugations provide better strength than shallow, spaced-out ones.

- **Gauge (Wall Thickness)**

  Thicker gauges provide higher structural strength for a given diameter and corrugation profile.

- **Diameter**

  Larger diameters have lower stiffness; smaller diameters provide greater rigidity.

Together, these three factors define the pipe's structural capacity to support various cover heights. This is detailed in the following chart:

FLONIK® PIPE – MINIMUM AND MAXIMUM COVERS – H-20 / H-25 LIVE LOADS – ALUMINIZED / GALVANIZED / POLYMER-COATED STEEL

Diameter in(cm)	min cover feet / mts	Max cover Feet / mts		
	H-20 / H-25	H-20 / H-25		
		Calibres		
		16	14	12
18" (45 cm)	1.0 / 0.30	68 (20)		
21" (53 cm)	1.0 / 0.30	58 (17)		
24" (60 cm)	1.0 / 0.30	51 (15)		
30" (76 cm)	1.0 / 0.30	41 (12)		
36" (90 cm)	1.0 / 0.30	34 (10)	48 (14)	
42" (107 cm)	1.0 / 0.30	29 (8)	41 (12)	69 (21)
48" (122 cm)	1.5 / 0.45	25 (7)	36 (10)	60 (18)
54" (137 cm)	1.5 / 0.45	22 (6)	32 (9)	53 (16)
60" (150 cm)	1.5 / 0.45	20 (5)	28 (8)	48 (14)
66" (167 cm)	1.5 / 0.45		26 (7)	44 (13)
72" (182 cm)	1.5 / 0.45		24 (7)	40 (12)
78" (198 cm)	1.5 / 0.45		22 (6)	37 (11)
84" (213 cm)	1.5 / 0.45			34 (10)
90" (228 cm)	2.0 / 0.60			32 (9)
96" (243 cm)	2.0 / 0.60			30 (9)
102" (260 cm)	2.0 / 0.60			28 (8)

Notes:

1. Tables apply to pipes with stapled seams.
2. Values were calculated using K = 0.86 per AISI Manual recommendations.
3. The minimum cover for H-20 and H-25 loads is measured from the pipe crown to the top of flexible pavement or rigid pavement.

Construction Procedure

Excavation

After trenching, the recommended width should be one pipe diameter plus 50 to 120 cm on each side to allow proper haunching, depending on compaction equipment. Less space may be acceptable with non-mechanical compacting backfill materials.
In embankment installations, remove all organic matter, topsoil, mud, roots, and protruding stones to create a stable and uniform foundation with appropriate compaction.

Bedding/Foundation

A uniform, stable foundation must be provided to ensure the pipe performs as designed. Use fine granular materials (max 3" aggregate) compacted to at least 90% Standard Proctor density.

Do not install the pipe directly on organic soil, frozen ground, or rocky surfaces. Remove unstable base material and replace it with suitable fill.

If concrete cradle bedding is needed, never place the steel pipe directly on concrete—instead, use a layer of compacted granular material between the pipe and concrete.
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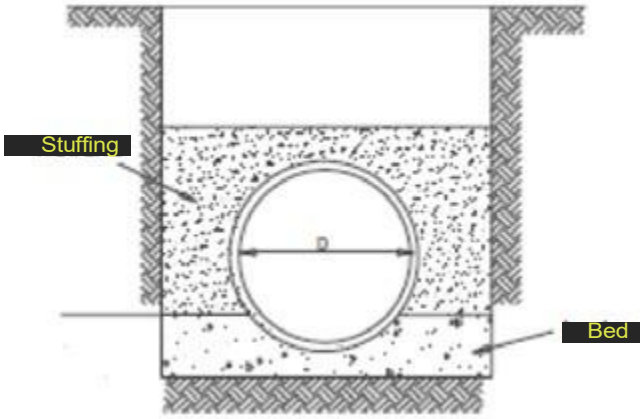


Pipe Handling

Although steel pipe structures can withstand standard handling, careful handling is essential to prevent damage to protective coatings. Avoid dragging the pipe. FLONIK® pipe is lightweight and can be lifted with light equipment—slings are recommended for proper handling.

Pipe Installation

During installation, joint connections must be properly sealed to prevent infiltration/exfiltration, which can lead to soil migration and compromise backfill integrity.

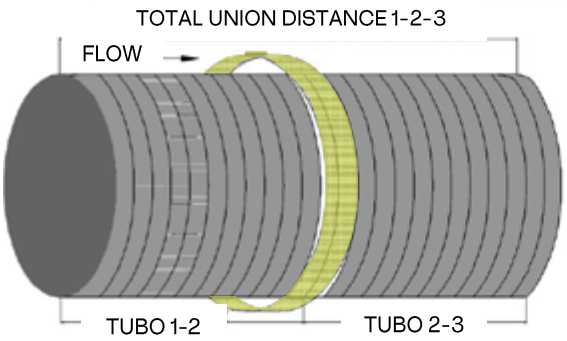
Pipes are joined using steel coupling bands:

- Slide the open band onto the end of the first pipe section.
- Align the second pipe section, leaving about 1 inch (25 mm) between ends.
- Ensure all surfaces are clean and free of dirt, sand, or debris.
- Align the band corrugations with those of the pipe, then tighten the bolts to create a secure, continuous structure.

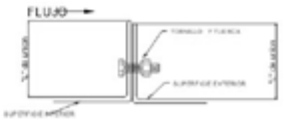
Band types by pipe diameter:

- 12"–48": one-piece band
- 54"–96": two-piece band
- 102" and up: three-piece band

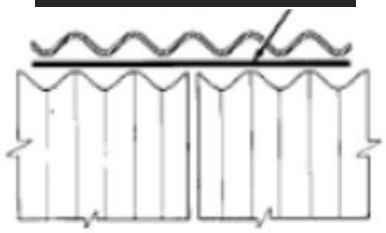
Union of tubes according to helical sequence to the cut



Translap belt detail



Packaging Sleeve



Pipe Bedding

Use loose fine granular materials to fill spaces between corrugations. Minimum bedding thickness before pipe placement:

- 1 inch (25 mm) for ½-inch corrugation depth
- 2 inches (50 mm) for 1-inch corrugation depth

Bedding width should be at least equal to the pipe diameter.

Backfill

The structural performance of any pipe depends heavily on proper backfill. Use well-graded, selected granular material with minimal silt and clay content. Fill should be free of organic matter, frozen soils, roots, or rocks over 3 inches (75 mm).
Backfill must be placed symmetrically. In 15–20 cm (6–8 inch) lifts, compacted to 90% Standard Proctor density (AASHTO T99). Special attention must be given to properly compact the haunch zone to maintain structural integrity.

Multiple Pipe Installations

Backfill must be applied evenly across all pipe structures. The design must consider compactability between pipes. Flowable backfill may be used to eliminate the need for mechanical compaction and reduce spacing requirements.

Recommended minimum spacing:

- For pipes 24"–72": at least ½ the pipe diameter
- For pipes >72": at least 36 inches (915 mm)