

The Storm Sewer System of Choice Corrugated Steel Pipe (CSP)

Spiral Rib CSP vs. HDPE

Spiral Rib CSP provides an effective and economical storm sewer solution that has a history of strength and durability.

- Predictable Service Life of 100+ Years
- Custom Lengths and Premium Coatings Available
- Cost-Effective
- Manning's "n" = 0.012



LOAD CAPACITY OF SPIRAL RIB CSP VS. CORRUGATED HDPE PIPE

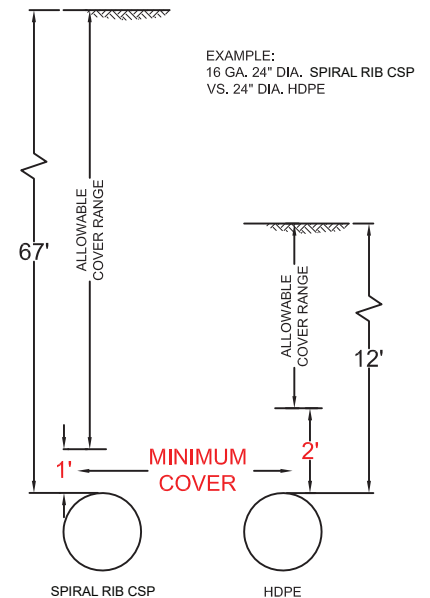
Minimum and maximum allowable heights of cover reflect the load capacity of the pipe. The allowable covers for Spiral Rib CSP offer a much wider range of loading conditions.

MINIMUM COVER – Due to thermal expansion in thermoplastic pipe, a new AASHTO provision requires a minimum of 2.0 feet of soil cover over HDPE pipe, or pipe span/2 for diameters above 48". For Spiral Rib CSP, the minimum cover is 1.0 foot of soil through 48" diameter, or pipe span/4. **The minimum cover for Spiral Rib CSP is roughly half that of HDPE in all diameters.**

MAXIMUM COVER – The load capacity advantage of Spiral Rib CSP is further displayed in the maximum cover tables, which represent the highest allowable load for a pipe. The maximum height of cover for Spiral Rib CSP pipe is much higher than that of HDPE (see table below). When calculating maximum cover for Spiral Rib CSP, the values shown in the table are for all acceptable backfill materials. The maximum cover for HDPE is dependent on soil type and compaction condition. Therefore the allowable cover for HDPE is dependent on ensuring that the more stringent backfill material requirements are met.

PRODUCT COMPARISON

Spiral Rib CSP vs. Corrugated HDPE Pipe								
Diameter (in)	Minimum Cover (ft)		Maximum Cover (ft)					
	Spiral Rib CSP	HDPE Pipe	Spiral Rib CSP				HDPE Pipe	
			Class 1, 2, or 3 soil - 90% compaction				Class 2 soil - 90% compaction	Class 3 soil - 90% compaction
			16 gage	14 gage	12 gage	10 gage		
12*	1	2	125	157			20	16
15*	1	2	100	125			21	16
18	1	2	90	126			19	14
24	1	2	67	95	158		17	12
30	1	2	54	75	126		14	10
36	1	2	45	63	105		15	11
42	1	2	38	54	90		15	11
48	1	2	33	47	78	114	13	9
54	1.25	2.25	29	41	90	101	14	10
60	1.25	2.5		37	63	91	14	10
66	1.5	not available		34	57	83	not available	not available
72	1.5				52	76		
78	1.75				48	70		
84	1.75				44	65		
90	2					60		
96	2					56		
102	2.25					50		



Notes:

1. HDPE pipe manufacturers have differing pipe wall profiles. Therefore, their outside pipe diameters and maximum cover heights can vary. The values shown are intended to be typical of AASHTO M294 HDPE pipe.
 2. For HDPE and CSP, minimum cover is per the AASHTO LRFD Bridge Design Specification, 2012, Section 12.6.6.3.
- * Spiral Rib CSP has a manning's n value of 0.012. Since its minimum diameter is 18", the values shown in the table for 12" and 15" diameter CSP are for 2 2/3" x 1/2" corrugation, where n = 0.011 for 12" and n = 0.012 for 15".



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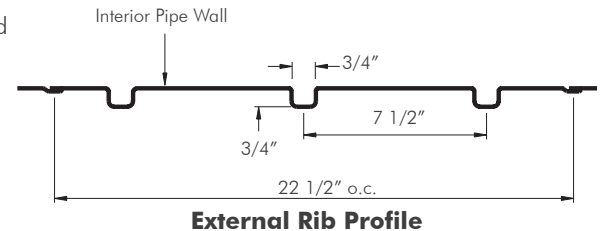
Spiral Rib CSP vs. HDPE

SUBMITTAL FOR SPIRAL RIB PIPE AS AN ALTERNATE STORM SEWER MATERIAL

Please consider this a formal request for your review and approval of Aluminized Type 2 (ALT2) Spiral Rib Pipe for storm sewer application and inclusion into this project. NCSPA proposes to furnish this pipe as an alternate to the project specified material.

ALUMINIZED TYPE 2 SPIRAL RIB PIPE:

1. Significant material cost savings
2. Fast lead times
3. Installation advantages offered by lightweight pipe in long lengths
 - a. 48" spiral rib pipe is 49lbs/ft, coupled with 24 ft lengths means maximum production value (custom lengths also available)
 - b. Utilize lightweight equipment
 - c. All junctions, fittings, manholes, grate inlets, etc. can be handled "in-line" as a fabricated fitting – "Feels like another piece of pipe..."



ALUMINIZED TYPE 2 SPIRAL RIB PIPE FOR STORM SEWER

1.0 GENERAL

This specification covers the furnishing, installation, and design considerations for Aluminized Type 2, Spiral Rib Pipe and Pipe-Arch for culverts and storm sewers for the types, sizes, and designations as shown on the plans.

2.0 MATERIAL

The pipe shall be fabricated from an ALUMINIZED Type 2 coil, conforming to the requirements of AASHTO M-274 or ASTM A-929.

3.0 PIPE

The pipe and pipe-arch shall be manufactured to conform to AASHTO M-36 or ASTM A-760. The pipe shall have a helical corrugation pattern, and shall have the sectional properties per AASHTO Section 12.5.4.1 or ASTM A-796

4.0 COUPLING BANDS

Coupling bands for the pipe and pipe-arch shall be made of the same base metal and coatings as the pipe and pipe-arch. Huger bands and fully corrugated bands for round or pipe-arch shall be a minimum of 18 gage, 12" wide bands with annular corrugations that are spaced to properly index with re-rolled corrugations of the pipe.

5.0 INSTALLATION

The pipe shall be installed in accordance with AASHTO Section 26, Division II or ASTM A-798.

6.0 HYDRAULICS

Values of Coefficient of Roughness (Manning's "n") will not exceed 0.012 or that recognized by other materials.

7.0 STRUCTURAL

Material thickness will be determined based on AASHTO Section 12 and specific loading conditions. For highway loading, minimum Height of Covers are 12", 15" and 18" for up to and including 48" diameter, 54" to 60" and 66" to 72" diameter pipes, respectively. Further consideration can be made for pipes exceeding 72" diameter.

8.0 DURABILITY

Aluminized Type 2 pipe provides a minimum service life of 75 years in the appropriate environment. ($5.0 \leq \text{pH} \leq 9.0$, $r > 1500$ ohm-cm) Considering the application for use is pavement surface runoff with select backfill, it is anticipated that a minimum service life of 75 years will be achieved.