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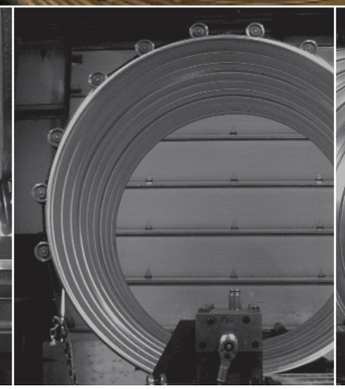
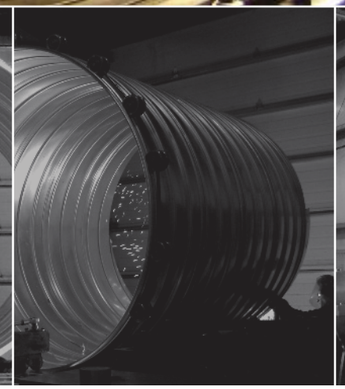
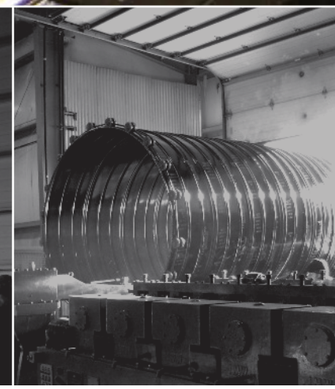
FloCore™







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FloCore Spiral Rib Pipe

Canada Culvert has built its reputation on innovation, quality and service. FloCore is one more example of Canada Culvert's innovation in the drainage industry to service the needs of its customers.

FloCore is the ideal water management solution with significant advantages over other drainage products. This unique drainage product offers a wide variety of sizes, shapes, thicknesses, fittings, lengths and special coatings. FloCore is a flexible interior smooth wall pipe with external stiffener ribs resulting in superior hydraulic performance.

FloCore is manufactured by a continuous interlocking spiral seam with external 19mm x 19mm square shaped stiffener ribs on 190mm centres. This combination of design and manufacturing produces a hydraulically smooth interior wall pipe with a Manning's "n" equivalent to the standard 0.013 used in storm sewer design.

Durability

FloCore pipe is fabricated from a base product of steel with various coatings to meet the demands of various environmental conditions. FloCore products range from lightweight Galvanized coatings for temporary applications to premium Polymer Laminated coatings with a material service life of 100 years. Field and laboratory studies combined with in-field knowledge will assist in determining the best combination of coating and steel thickness for the application.

Coatings Include:

Light Weight Galvanized (Z275)
Standard Galvanized (Z610)
Aluminized Type 2
Polymer Laminated

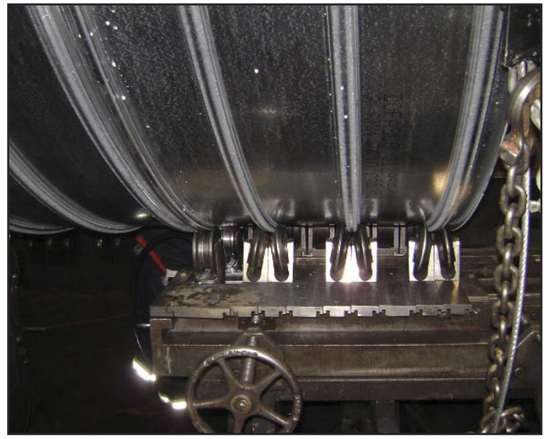
Economical

FloCore is more cost effective than other drainage products when all aspects of the application and design are considered.

Long lengths can be manufactured thereby requiring fewer couplers and reducing installation times. The longer lengths of the spiral rib pipe permit more accurate alignment during construction and the subsequent life of the structure.

Lighter weight FloCore provides for a quicker easier installation when compared to other drainage products. FloCore can be handled by smaller equipment on site and installed with little effort.

Nesting FloCore for transport is an advantage since freight costs are reduced.



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Applications

The inherent strength of FloCore is derived from the mechanical properties of steel combined with the steel-soil interaction. The steel-soil interaction allows for high-ring compression strength in a relatively thin-walled structure. FloCore is best utilized in the following applications but not restricted to:

Storm Sewer	Small Bridges	Relining
Storm Drainage	Drainage	Utility Conduits
Culverts		

Standards and Quality Control

Canada Culvert manufactures its products to repeatable and exacting standards, thereby ensuring customers receive quality products. FloCore's quality is visible and easily quantifiable by measuring steel thickness, coating, corrugation profile and lock seams. Each pipe length is mill stamped and identifiable.

FloCore is manufactured to the exacting standards of CSA G401 and ASTM.

Sizes and Shapes

FloCore is available in full round sizes from 400mm to 2600mm. However, for situations where cover height is limited, Canada Culvert can manufacture a wide range of pipe-arch sizes from 500/410mm (span/rise) to 1850/1400mm (span/rise). The low, wide pipe-arch shape design provides hydraulic advantages by handling large volumes of water under low head conditions.

Couplers

FloCore is quickly joined on site with preformed couplers that resist shear and prevent pipe disjointing. Canada Culvert offers corrugated annular couplers for positive connection. The corrugated annular coupler seats positively in the re-corrugated ends and is typically suitable for all corrugated steel pipe installations. Couplers are available in different widths according to the pipe size and design criteria.

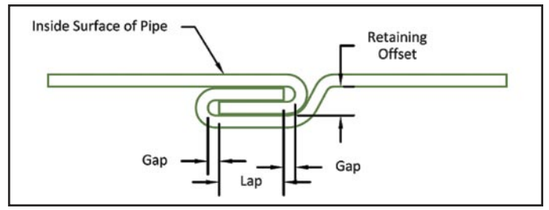
For applications that require improved soil tightness, neoprene gaskets are available.

Fittings

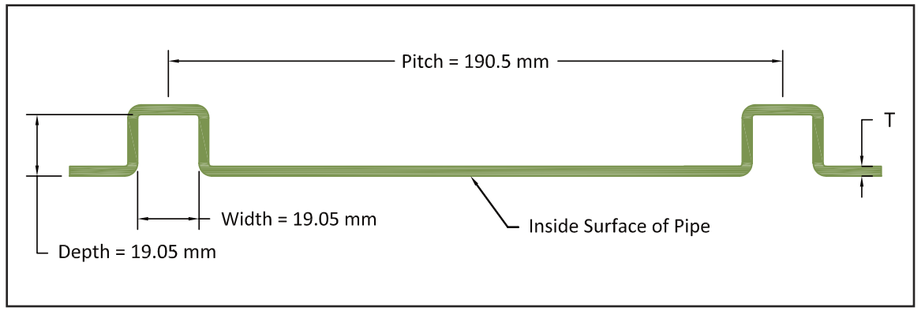
FloCore's fittings are available in a full range of pipe sizes and thickness. Standard fittings include:

Tees	Catchbasins
Stubs	Elbows and Wye's
Manholes with safety ladders.	

Special fittings such as drop inlets, manholes, and catch basins can be fabricated to meet specific job requirements.



Section Design Properties for FloCore Pipe



RIB PROFILE: 19 x 19 x 190 mm (HELICAL)

Wall Thickness		Area	Moment of Inertia	Section Modulus	Radius of Gyration	Developed Width Factor
Specified	Design					
T	T	A	I	S	r	WF
mm	mm	mm^2/mm	mm^4/mm	mm^3/mm	mm	*
1.6	1.519	1.082	58.829	4.016	7.375	1.170
2.0	1.897	1.513	77.674	5.054	7.164	1.168
2.8	2.657	2.523	117.167	7.129	6.815	1.165

*WF is the ratio of the flat sheet width to the corrugated sheet width.
Properties are effective section properties at full yield stress.
Note: Dimensions are subject to manufacturing tolerances.

Installation and Backfill

All pipe installations require several components to ensure they will function properly and efficiently: proper pipe placement, adequate foundation support, correct backfill material and compaction, and reasonable care during installation.

Pipe material thickness (gauge) is based on minimum and maximum cover conditions and backfill material (refer to Height of Cover tables.)

Shape monitoring is recommended as good practice with any type of installation and the same holds true with FloCore. Measuring the rise and span at several locations along the installation ensures the proper placement and compaction methods are being implemented.

Care must be exercised when handling the pipe so that damage does not occur to the pipe itself or to the coating during unloading and installation procedures.

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FloCore Round Pipe Handling Weights (kg/m)

Diameter (mm)	End Area (m^2)	Specified Wall Thickness (mm)		
		1.6	2.0	2.8
450	0.16	21.9	26.8	–
525	0.22	25.6	31.3	42.6
600	0.28	29.2	35.8	48.6
750	0.44	36.5	44.7	60.8
900	0.64	43.8	53.6	72.9
1050	0.87	51.1	62.6	85.1
1200	1.13	58.4	71.5	97.3
1350	1.43	–	80.5	109.4
1500	1.77	–	89.4	121.6
1650	2.14	–	98.3	133.7
1800	2.54	–	107.3	145.9
2100	3.46	–	125.2	170.2
2400	4.52	–	–	194.5
2600	5.31	–	–	210.7

"Notes:"
Handling weights are approximate.
Those weights not shown indicate that particular size or steel thickness is either not generally recommended practice, or may not be possible to fabricate.
Size/thickness combinations not shown may be available.

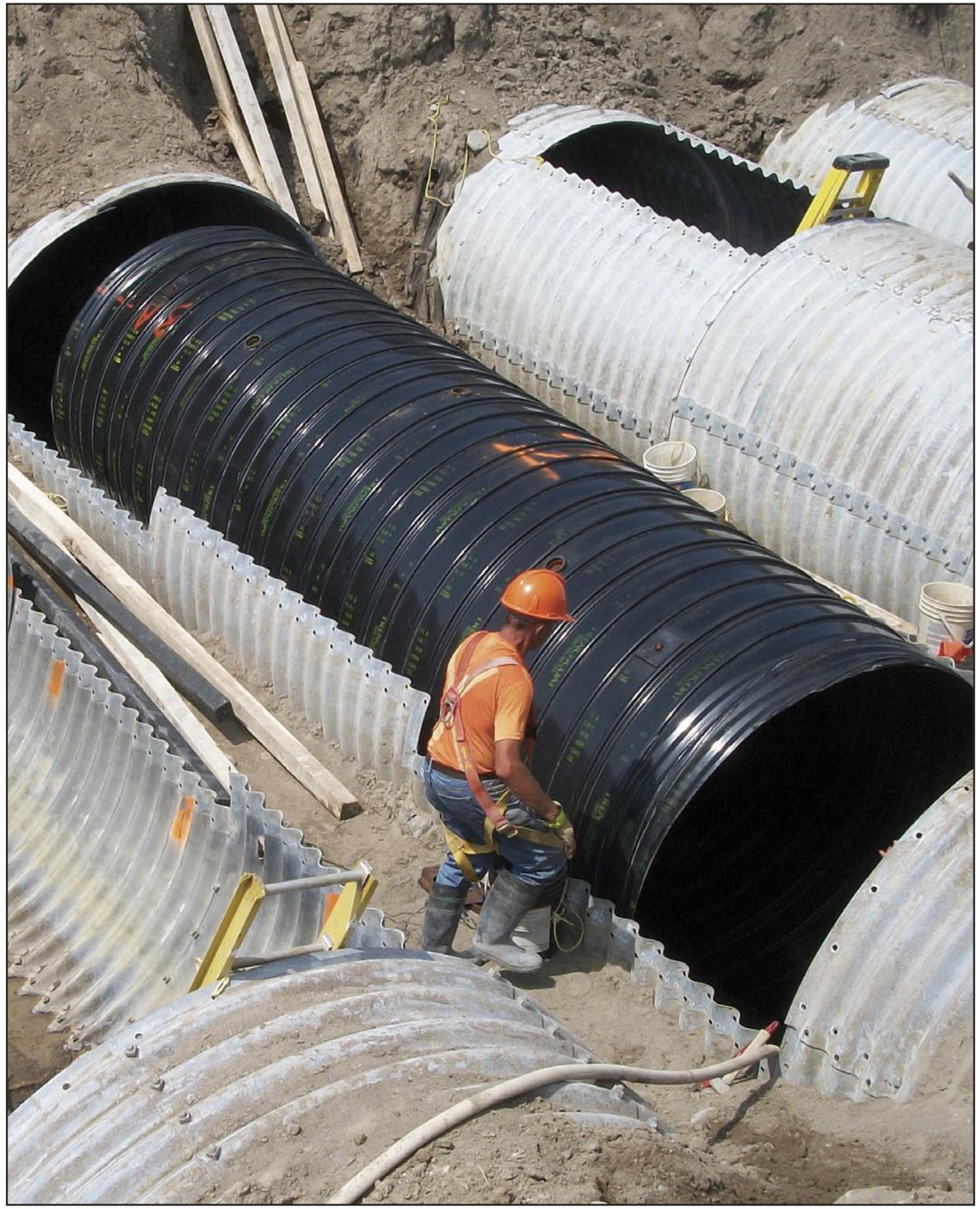
19 x 19 x 190 mm RIB PROFILE GALVANIZED STEEL OR ALUMINIZED STEEL TYPE 2

FloCore Pipe-Arch Shapes and Handling Weights (kg/m)

Span (mm)	Rise (mm)	Equivalent Round Diameter (mm)	End Area (m^2)	Specified Wall Thickness (mm)		
				1.6	2.0	2.8
500	410	450	0.15	21.9	26.8	–
580	490	525	0.21	25.6	31.3	42.6
680	540	600	0.27	29.2	35.8	48.6
830	660	750	0.43	36.5	44.7	60.8
1010	790	900	0.62	43.8	53.6	72.9
1160	920	1050	0.85	–	62.6	85.1
1340	1050	1200	1.12	–	–	97.3
1520	1200	1350	1.44	–	–	109.4
1670	1300	1500	1.79	–	–	121.6
1850	1400	1650	2.15	–	–	133.7

"Notes:"
Handling weights are approximate.
Those weights not shown indicate that particular size or steel thickness is either not generally recommended practice, or may not be possible to fabricate.
Size/thickness combinations not shown may be available.

19 x 19 x 190 mm RIB PROFILE GALVANIZED STEEL OR ALUMINIZED STEEL TYPE 2



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Height of Cover Table - FloCore Round Pipe

Diameter (mm)	Area (m^2)	Minimum Height of Cover (mm)	Metal Thickness (mm)		
			1.6	2.0	2.8
			Maximum Height of Cover (m)		
450	0.16	300	22.7	33.6	-
525	0.22	300	19.4	28.8	50.6
600	0.28	300	17.0	25.2	44.3
750	0.44	300	13.6	20.2	35.4
900	0.64	300	11.3	16.8	29.5
1050	0.87	300	9.7	14.4	25.3
1200	1.13	300	8.5*	12.6	22.1
1350	1.43	340	7.5*	11.2	19.7
1500	1.77	380	6.8*	10.1*	17.7
1650	2.14	410	-	9.1*	16.1
1800	2.54	450	-	8.4*	14.7
2100	3.46	530	-	-	12.6*
2400	4.52	600	-	-	11.0*
2600	5.31	650	-	-	9.0*

"Notes:"

1. Allowable minimum cover is measured from the top of pipe to the bottom of a flexible pavement or top of a rigid pavement. Minimum cover in unpaved areas must be maintained.
2. All heights of cover are based on installation in a trench. If embankment conditions exist, there may be restrictions on gauges for large diameters. A CANADA CULVERT Representative will be able to provide further guidance.
3. Tables are for CL-625 loading only. For heavy construction loads, higher minimum covers may be required. A CANADA CULVERT Representative will be able to provide further guidance.

*These sizes and gauges are installed in accordance with ASTM A796 paragraph 17.2.2 and ASTM A798

Height of Cover Table - FloCore Pipe Arches

Span (mm)	Rise (mm)	Equivalent Diameter (mm)	Area (m^2)	Minimum Height of Cover (mm)	Metal Thickness (mm)		
					1.6	2.0	2.8
					Maximum Height of Cover (m) to Limit Corner Bearing Pressure to a Maximum of 200 kPa		
500	410	450	0.15	300	4.0	4.0	-
580	490	525	0.21	300	5.2	5.2	5.2
680	540	600	0.27	300	5.2	5.2	5.2
830	660	750	0.43	300	5.2	5.2	5.2
1010	790	900	0.62	300	4.4	4.4	4.4
1160	920	1050	0.85	300	5.1	5.1	5.1
1340	1050	1200	1.12	300	-	4.4	4.4
1520	1200	1350	1.44	340	-	5.3*	5.3
1670	1300	1500	1.79	380	-	5.1*	5.1
1850	1400	1650	2.15	410	-	4.7*	4.7

"Notes:"

1. Allowable minimum cover is measured from the top of pipe to the bottom of a flexible pavement or top of a rigid pavement. Minimum cover in unpaved areas must be maintained.
2. All heights of cover are based on installation in a trench. If embankment conditions exist, there may be restrictions on gauges for large diameters. A CANADA CULVERT Representative will be able to provide further guidance.
3. Tables are for CL-625 loading only. For heavy construction loads, higher minimum covers may be required. A CANADA CULVERT Representative will be able to provide further guidance.

*These sizes and gauges are installed in accordance with ASTM A796 paragraph 17.2.2 and ASTM A798