

STEELCOR™



CANADACULVERT™

INNOVATION FLOWS FROM HERE

all corrugated steel pipe are not created equal >

STEELCOR™



CANADA CULVERT has compiled years of research to manufacture an advanced, structurally superior corrugated steel pipe that'll take on today's drainage challenges. The result is STEELCOR™. A cost-effective and durable solution that gets the job done for road builders, municipalities, forestry companies, as well as oil and gas customers. Across the nation in every environment imaginable, CANADA CULVERT's STEELCOR is proving to be the corrugated steel pipe of choice.

SUPERIOR STRUCTURAL STRENGTH AND VALUE THAT ARE SECOND TO NONE

The inherent strength of STEELCOR is derived from the mechanical properties of steel and combined with the steel/soil interaction. CANADA CULVERT's advanced steel manufacturing processes allow for high-ring compression strength in a relatively thin-walled structure with incomparable and proven strength. With a long history of industry research and quality systems used at CANADA CULVERT, end users can be confident that STEELCOR meets all required specifications. Our superior processes enable STEELCOR to be one-tenth the weight of heavier rigid pipe, which means this lightweight product allows for easy handling, installation, loading and unloading by the end user.

COATINGS THAT STAND UP TO ANY ENVIRONMENT

CANADA CULVERT offers four coatings that allow STEELCOR to endure normal to severe environmental conditions: Z275 (light galvanized); Z610 (standard galvanized); Aluminized Type II; and Polymer Laminated. STEELCOR in general is considered a flexible structure that can be installed on unforgiving foundations and still perform satisfactorily.



POLYMER LAMINATED

A coating for long-term applications. It's a tough, heavy-gauge film at least 10-mils thick laminated to both the inside and outside surfaces of the Z610 galvanized corrugated steel pipe. This plastic coating provides a superior barrier, resisting all corrosive materials, such as acids, salts, and alkalines. The Polymer Laminated STEELCOR is a great alternative to concrete and asphalt-coated pipe because it's half the weight. This coating offers a long-term service life with superior resistance and corrosion protection for up to 100 years or more.

ALUMINIZED TYPE II

This type of coating offers the corrosion resistance and surface characteristics of aluminum with the strength, durability, and economy of corrugated steel pipe. This product is fabricated from steel coils coated in commercially pure aluminum. A hard aluminum-iron alloy layer beneath the aluminum coating provides further protection against abrasion. The coating has a strong bond between metals and a uniform thickness on both inside and outside the pipe. Aluminized Type II STEELCOR is ideal for storm sewer and drainage projects with 75 years or more. A durable and economical alternative to reinforced concrete pipe.

GALVANIZED Z610

Z610 galvanized (610g/m²) is a hot-dip zinc coating that forms a superior barrier over steel. Calcium attracted from naturally hard water can aid in providing additional protection as it develops mineral scale on the pipe surface. As the zinc coating corrodes slowly over time, it galvanically protects the base steel as long as any zinc remains.

GALVANIZED Z275

Z275 coating is a light, 275g/m² commercial galvanized coating suitable for short-term projects (three to 15 years). Galvanized Z275 is a zinc coating for short-term corrosion protection in temporary applications where culverts will be abandoned. Z275 offers a substantial savings because it reduces the zinc coating by more than half and ultimately reduces the risk of zinc leaching into the surrounding soil and water. CANADA CULVERT's Z275 coating is ideal for forestry roads that will be deactivated, temporary lease roads, construction site drainage, or temporary cribbing applications.

100 years

POLYMER LAMINATED

75 years

ALUMINIZED TYPE II

50 years

SERVICE LIFE (TYPICAL RANGES)

Z610

15 years

Z275

0 years

**CANADA CULVERT'S STEELCOR™ CORRUGATED STEEL PIPE
ADVANTAGES THAT ADD UP**

STEELCOR offers some very distinct advantages over other drainage products. This unique product offers a wide variety of sizes, shapes, profiles and thicknesses, coupler types, fittings, a range of lengths, and special coatings. STEELCOR is so versatile that it's not just for traditional drainage anymore! Applications include:

- Culverts
- Small bridges
- Storm drainage
- Storm water detention
- Underpasses and cattle crossings
- Utility conduits
- Cisterns
- Well and power pole cribbing

Exactng Quality

CANADA CULVERT manufactures its products to repeatable and exacting standards, thereby ensuring customers receive quality products. STEELCOR's quality is visible and easily quantifiable by measuring steel thickness, coating, corrugation profile and lock seams. Other drainage products such as plastic and RCP rely on plant certification as an indicator for quality. Since HDPE resin, cement admixtures, cement, aggregates, and reinforcing steel placement quality cannot be determined in the field, consumers cannot verify through on-site inspection that the product was in fact manufactured to specification.

REFERENCE SPECIFICATIONS		
Galvanized Steel	Pipe	CSA G401
	Material	ASTM A929
Aluminized Type II	Pipe	CSA G401
	Material	ASTM A929
Polymer Laminated	Pipe	ASTM A929
	Material	ASTM A742
Bolts and Nuts	Material	ASTM A307

Versatile

Full round STEELCOR is appropriate for most applications. However, for a situation where height cover is limited, CANADA CULVERT can manufacture a pipe-arch shape. The low, wide pipe-arch shape design provides hydraulic advantages by handling large volumes of water under low head conditions.

STEELCOR can be manufactured to six thickness specifications: 1.3mm (18ga); 1.6mm (16ga); 2.0mm (14ga); 2.8mm (12ga); 3.5mm (10ga); and 4.2mm (8ga). Available corrugation profiles are shown in the table along with corresponding pipe diameters. Variations in thicknesses and corrugation profiles enable STEELCOR to meet any structural design requirements.

CORRUGATION PROFILE	PIPE DIAMETER
38 x 6.5mm	150mm – 250mm
68 x 13mm	300mm – 3300mm
125 x 25mm	1200mm – 4300mm

Since not all installations are straight, CANADA CULVERT manufactures tees, elbows, wyes, reducers, saddles, manholes and catch basins in the full range of pipe sizes. We also fabricate large diameter fittings, support rings and grates to meet specific job requirements.

Coatings

Four coatings are available that allow STEELCOR to endure normal to severe environmental conditions: Polymer Laminated; Aluminized Type II; Z610 (standard galvanized); and Z275 (light galvanized). STEELCOR in general is considered a flexible structure that can be installed on unforgiving foundations and still perform satisfactorily.

Economical

STEELCOR is more cost effective than other drainage structures when all aspects of the application are considered.

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

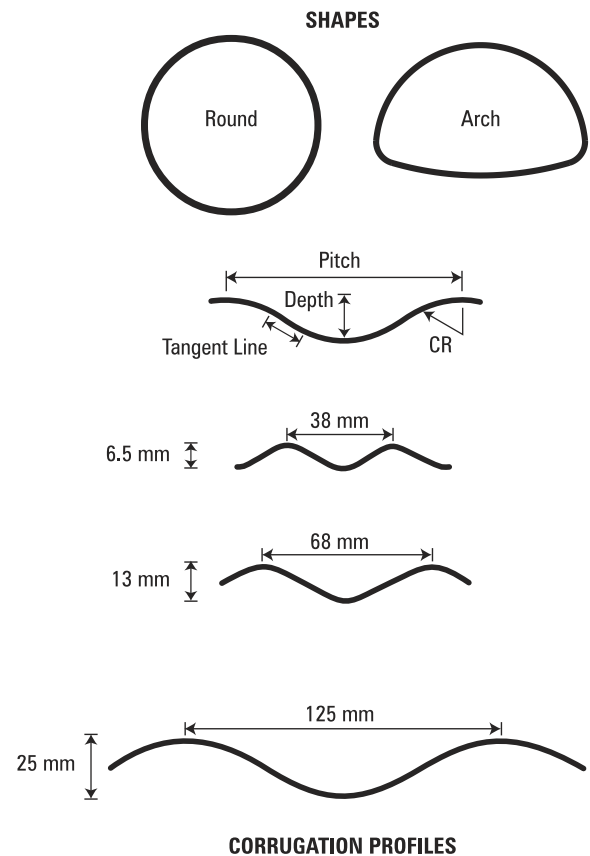
Lighter weight STEELCOR provides for a quicker and easier installation (Comparison 1200mm x 2.8mm CSP-97kg/m, 1200mm RCP – 1290kg/m). STEELCOR can be handled by smaller equipment on site and installed with little effort. Finally, nesting STEELCOR for transport is an advantage since freight costs are reduced.

Strong

The inherent strength of STEELCOR is derived from the mechanical properties of steel combined with the steel-soil interaction. Advanced steel manufacturing process ensures all material meet specification every time. The steel-soil interaction allows for high-ring compression strength in a relatively thin-walled structure. STEELCOR absorbs and transfers the vertical live and dead loads to the surrounding soil around the entire circumference of the pipe.

Durable

The proper selection of coating and steel thickness enables STEELCOR to meet any service life requirements. Appropriate coating choices can be determined after evaluating life cycle costs, environmental conditions, and abrasion severity. STEELCOR products range from lightweight galvanized coatings for temporary applications to premium coatings with a 100 year life.

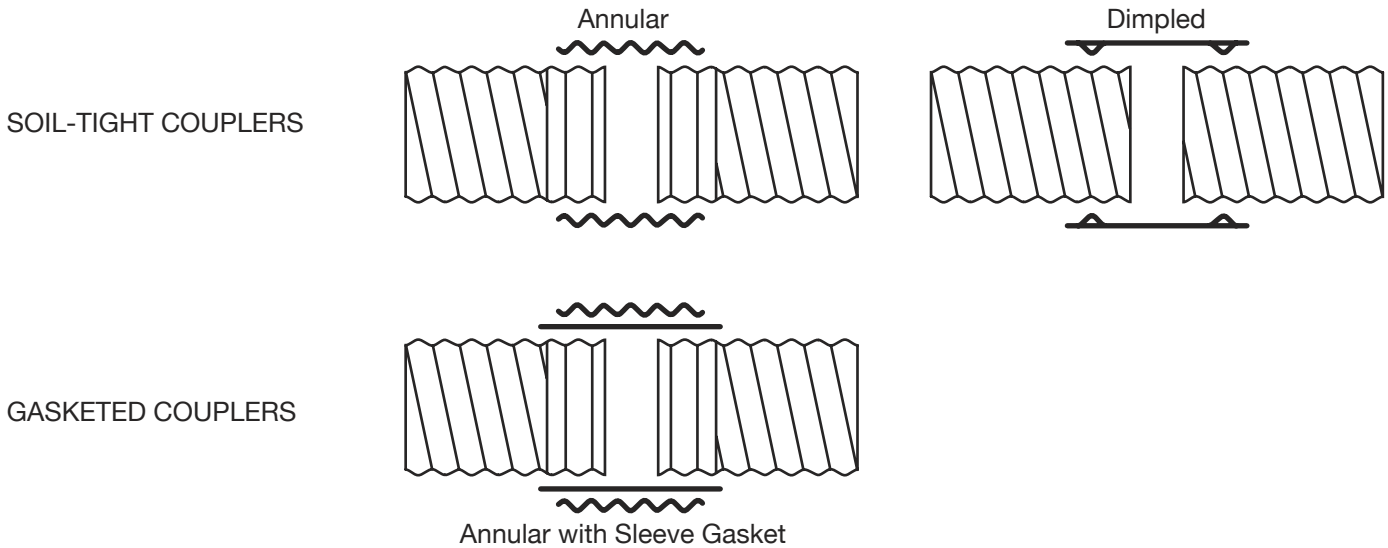


ENDS AND COUPLERS

STEELCOR is quickly joined on site with preformed couplers that resist shear and prevent pipe disjoining. CANADA CULVERT offers corrugated annular, dimpled, as well as helical couplers for small diameter pipe. The corrugated annular coupler seats positively in the recorrugated ends and is typically suitable for all corrugated steel pipe installations.

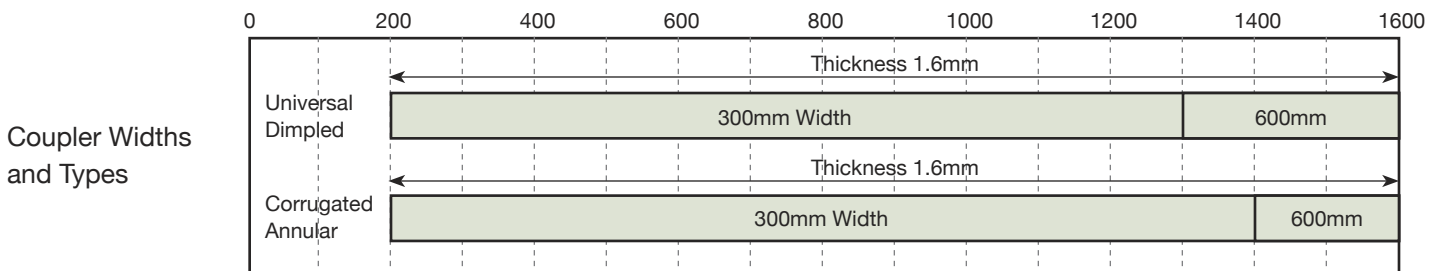
For applications that require restricted leakage, watertight gaskets are available to improve coupler performance.

End/Coupler Types

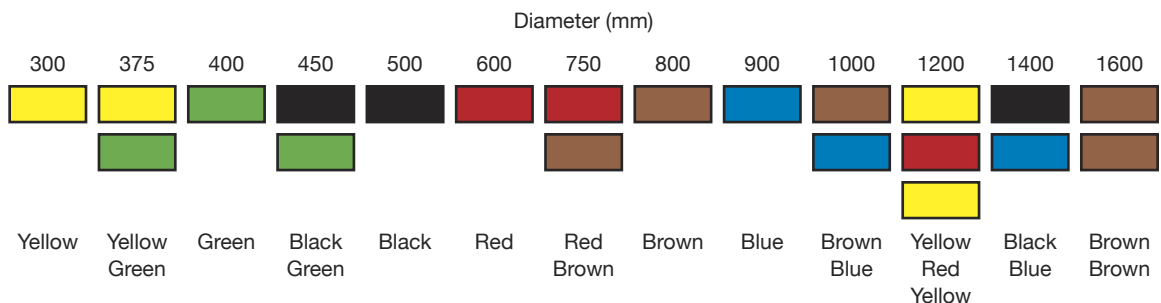


Coupler widths may vary by provincial specifications. Where more restricted leakage is required, the couplings can be supplemented with gaskets.

Recommended Coupler Selection Chart



CANADA CULVERT Colour Coding Chart



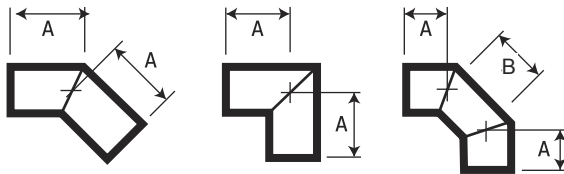
FITTINGS

STEECOR's fittings are available in a full range of pipe sizes and thickness. Standard fittings include tees, elbows, wyes, reducers, and saddle branches. Special fittings such as drop inlets, manholes, and catch basins can be fabricated to meet specific job requirements.

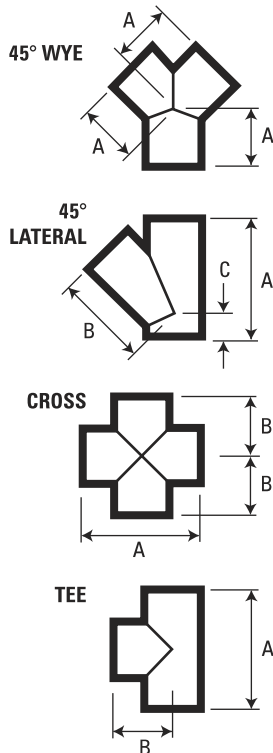
Fitting Type Specifications

2 Piece 10° - 45° Elbow		2 Piece 46° - 90° Elbow		3 Piece 46° - 90° Elbow		
Diameter	A	Diameter	A	Diameter	A	B
150 - 600	300	150 - 250	300	150	200	200
700 - 1400	600	300 - 800	600	200	185	230
1600 - 2400	900	900 - 1200	900	250	175	250
		1400 - 1600	1200	300	460	280
		1800 - 2400	1500	400	450	300
				500	425	350
				600	410	380
				700	400	400
				800	360	480
				900	600	600
				1000	610	580
				1200	570	660
				1400	750	900
				1600	780	840
				1800	750	900
				2000	1000	1000
				2200	950	1100
				2400	925	1150

ELBOWS FOR ROUND CSP



FITTINGS FOR ROUND CSP

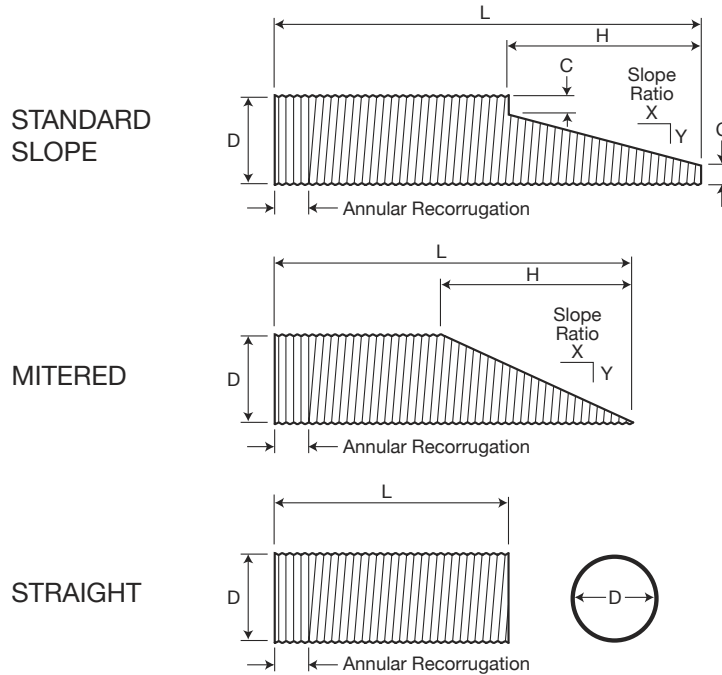


Main Dia.	Stub Same or Smaller Than Main Diameter							Same Dia. 45° Wye
	Tee		Cross		45° Lateral			
	A	B	A	B	A	B	C	
150	600	300	600	300	900	600	300	300
200	600	300	600	300	900	600	300	300
250	600	300	600	300	900	600	300	300
300	800	400	1200	600	1200	600	400	600
400	1200	600	1200	600	1200	900	400	600
500	1200	600	1200	600	1500	900	450	600
600	1200	600	1200	600	1500	900	500	600
700	1200	600	1200	600	1800	1200	600	600
800	1800	900	1800	900	2400	1500	660	900
900	1800	900	1800	900	2400	1500	660	900
1000	1800	900	1800	900	2400	1500	760	900
1200	1800	900	1800	900	3000	1800	810	900
1400	2400	1200	2400	1200	3600	2100	1100	1200
1600	2400	1200	2400	1200	3600	2400	1200	1200
1800	3000	1500	3000	1500	4200	2700	1250	1500
2000	3000	1500	3000	1500	4800	3000	1400	1500
2200	3000	1800	3000	1500	4800	3300	1500	1500
2400	3000	1800	3000	1800	4800	3300	1550	1800

1. Fittings in other dimensions can be manufactured to satisfy specific requirements.
2. Fitting connections may require 300mm wide dimple couplers.
3. All dimensions are in millimeters unless otherwise specified.

ENDS

CANADA CULVERT can fabricate end treatments that blend well with any surrounding. Typical ends include sloped, mitered, and straight.

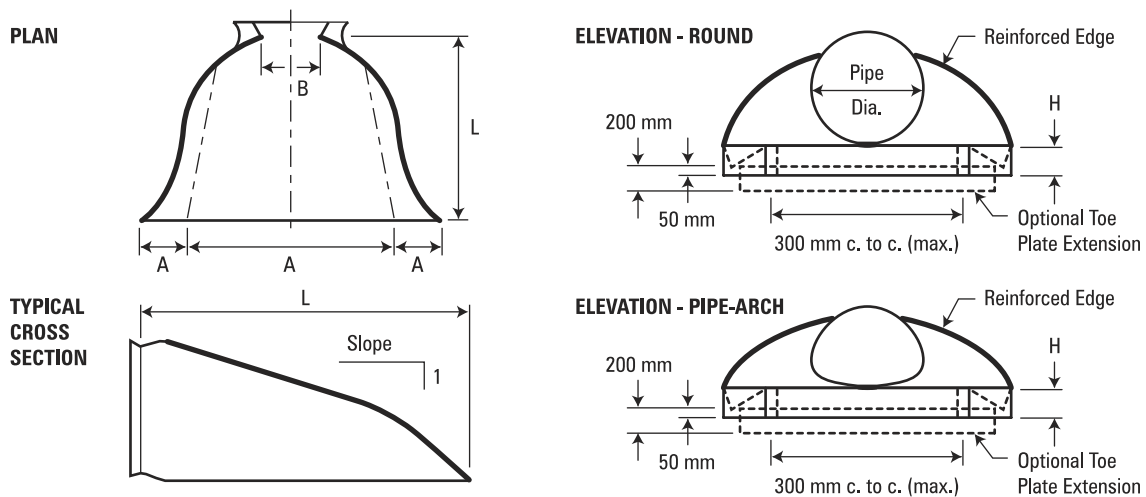


Diameter	2:1 Slope		3:1 Slope		4:1 Slope		Recommended Min. Length (m) L
	C	H	C	H	C	H	
300	75	300	75	450	75	600	6
400	75	500	75	750	100	800	6
500	75	700	125	750	125	1000	6
600	125	700	125	1050	125	1400	6
700	150	800	150	1200	150	1600	6
750	150	900	135	1440	175	1600	6
800	150	1000	150	1450	175	1800	6
900	150	1200	150	1800	200	2000	6
1000	150	1400	200	1800	225	2200	6
1050	150	1500	200	1950	250	2200	6
1200	150	1800	225	2250	275	2600	6
1400	200	2000	250	2700	300	3200	6
1500	200	2200	250	3000	300	3600	6
1600	200	2400	250	3300	300	4000	6
1800	300	2400	300	3600	300	4800	6
2000	300	2800	400	3600			8
2200	300	3200	500	3600			8
2400	400	3200	500	4200			8
2700	400	3800	600	4500			10
3000	500	4000					10
3300	500	4600					10

1. Standard Sloped Ends for Arch Pipe are available upon request.
2. All dimensions in millimeters unless otherwise specified.

END SECTIONS

CANADA CULVERT end sections are practical ways to prevent scour at the inlet and undermining at the outlet while increasing hydraulic efficiency. The prefabricated end sections create an attractive and durable side slope treatment that improves roadside appearance. They also have a galvanized coating for corrosion resistance and improved durability. CANADA CULVERT end sections can be used with corrugated steel pipe, plastic, and concrete pipe. The end sections are quickly and easily installed with lightweight equipment and a two-person crew. End sections can be installed during construction or after project completion. Safety slope end sections and cross drainage safety end sections are available upon request.



End Sections for Round Pipe										
Diameter (mm)	Diameter (in)	Thickness (mm)	A	B	H	L	W	Slope	Overall width	Weight (kg)
300	12	1.6	155	155	150	535	610	2.50	920	12
400	15	1.6	180	205	150	660	765	2.50	1125	15
450	18	1.6	205	255	150	790	915	2.50	1325	20
500	21	1.6	230	305	150	915	1070	2.50	1530	23
600	24	1.6	255	330	150	1045	1220	2.50	1730	30
750/800	30/32	2.0	305	410	205	1295	1525	2.50	2135	56
900	36	2.0	360	485	230	1525	1830	2.50	2550	62
1000/1050	40/42	2.8	410	560	280	1755	2135	2.50	2955	146
1200	48	2.8	460	690	305	1985	2290	2.25	3210	171
1400	54	2.8	460	765	305	2135	2595	2.25	3515	200
1600	66	2.8 / 3.5	460	915	305	2210	3050	2.00	3970	317
1800	72	2.8 / 3.5	460	995	305	2210	3200	2.00	4125	328
2000	78	2.8 / 3.5	460	1070	305	2210	3355	1.50	4275	369
2200	90	2.8 / 3.5	610	940	305	2210	3660	1.50	4880	414
2400	96	2.8 / 3.5	635	890	305	2210	3810	1.50	5080	448

1. End Sections for Arch Pipe are available upon request.
2. Toe Plate Extensions are optional.
3. All dimensions in millimeters unless otherwise specified.

DIMENSIONAL SPECIFICATIONS

STEELCOR Weights and End Areas

○ ROUND		Corrugation Profile: 38 x 6.5mm			
Diameter (mm)	End Area (m ²)	Weight (kg/m)	Wall Thickness (mm)		Coupler Weight (kg)
			1.3	1.6	155mm wide
150	0.018		5.9	7.2	2
200	0.031		7.7	9.5	3
250	0.049		9.6	12	3

○ ROUND		Corrugation Profile: 68 x 13mm					○ ARCH					
Diameter (mm)	End Area (m ²)	Weight (kg/m)	Wall Thickness (mm)					300mm wide	600mm wide	End Area (m ²)	Span x Rise (mm)	
			1.3	1.6	2.0	2.8	3.5					
300	0.07		12	14	18			8	13	0.11	450 x 340	
400	0.13		16	19	24			9	17			
450	0.16		18	21	27			10	18	0.19	560 x 420	
500	0.20		19	24	30			10	19			
600	0.28		23	28	35	49		12	21	0.27	680 x 500	
700	0.38			33	41	57		13	23	0.37	800 x 580	
750	0.44			35	44	61		14	24	0.48	910 x 660	
800	0.50			37	47	65		14	26			
900	0.64			42	53	73		15	28	0.61	1030 x 740	
1000	0.79			47	58	81	120	16	30	0.74	1150 x 820	
1050	0.87			49	61	85	126	17	32	1.06	1390 x 970	
1200	1.13			56	70	97	140	19	35			
1400	1.54					81	113	160	21	40	1.44	1630 x 1120
1500	1.77					87	121	171	22	42	1.87	1880 x 1260
1600	2.01					93	130	179		45		
1800	2.54						146	199		49	2.36	2130 x 1400
2000	3.14					162	219		54			
2100	3.46					170	230		55			
2200	3.80						239		58			

○ ROUND		Corrugation Profile: 125 x 25mm						
Diameter (mm)	End Area (m ²)	Weight (kg/m)	Wall Thickness (mm)				Coupler Weight (kg)	
			1.6	2.0	2.8	3.5	300mm wide	600mm wide
1200	1.13		57	71	100	124	19	35
1400	1.54		66	83	116	144	21	40
1500	1.77		71	89	124	154	22	42
1600	2.01		76	95	132	165		45
1800	2.54		85	106	148	185		49
2000	3.14		94	118	165	205		54
2100	3.46		99	124	173	215		55
2200	3.80		104	129	181	225		58
2400	4.52		113	141	197	245		63
2700	5.73		127	159	222	276		69
3000	7.07			176	246	306		76
3300	8.55				270	336		84
3600	10.18					367		92

- All STEELCOR weights are in kg/m. Coupler weights are in kg/coupler.
- The STEELCOR weights are based on helical lock seam fabrication and are approximate. Riveted STEELCOR weighs slightly more than spiral STEELCOR.
- Weights not shown in the above tables (blank spaces) indicate that the particular size or steel thickness is either not recommended practice or is not possible to fabricate.
- Coupler weights are based on annular couplers.
- All material weights assume standard galvanized coating.

INSTALLATION

STEELCOR Installations

The following guide is intended to serve as general guidance for the proper installation of STEELCOR. However, each installation is unique and therefore requires a specific evaluation based on pipe size and site conditions. The installer/designer should also refer to the appropriate provincial highway standards for proper installation guidelines.

Unloading and Handling

STEELCOR is relatively light weight and can be handled with light equipment or by hand. STEELCOR should never be dumped, dragged or unloaded in a manner that would damage the coating or alter the shape of the pipe. Premature corrosion can start around the damaged area if not repaired.

CANADA CULVERT grinds all STEELCOR ends to minimize sharp edges and burrs. However, proper safety equipment should be worn when working with this product.

Compaction and Backfill

Compaction of backfill under the haunches of round and pipe-arch structures is required. Proper compactions in these areas are critical to ensure that a steel-soil envelope is created. After compaction around the haunches, backfill should be spread in 150mm layers alternating between sides of the STEELCOR. The maximum side-to-side difference between lifts should never exceed 300mm.

Backfill for STEELCOR should be compacted to a minimum specified Standard Proctor Density of 95%. Common examples of compaction equipment include hand equipment, power tampers, rollers and vibrating compactors.

Preparing The Base

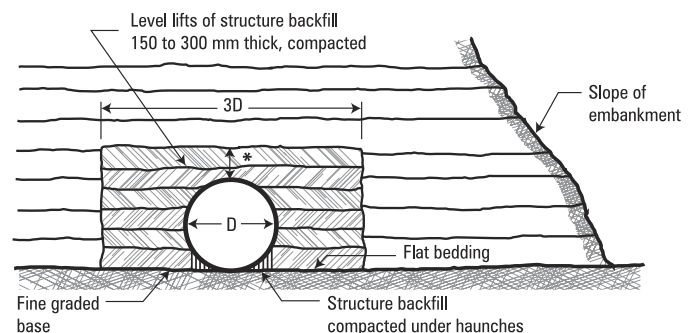
For standard installations it is recommended that the width of the foundation be at least three times the diameter of the STEELCOR and be free of rocks, mud, water, stumps and organic or frozen material. A properly installed base will facilitate proper alignment and grade of the STEELCOR during installation and the subsequent service life of the application.

A well-graded granular backfill that is at least 150mm in depth is recommended for the bedding. Poor soil conditions or granular material necessitate a more substantial base under the STEELCOR. The use of a geotextile material is common to provide soil strength and separation.

The order of preference of acceptable backfill material is given below:

- Well-graded sand and gravel that is sharp, rough or angular if possible
- Uniform sand or gravel
- Mixed soils (not recommended for large structures)

TYPICAL BACKFILL ENVELOPE FOR ROUND PIPE INSTALLED ON FLAT BEDDING, IN AN EMBANKMENT CONDITION



* Minimum cover of structure backfill is $D/6$ or 300 mm, whichever is greater.

British Columbia

Dawson Creek
Genelle
Langley
Prince George

Alberta

Edmonton
Grande Prairie
Ponoka

Saskatchewan

Regina
Saskatoon

Manitoba

Winnipeg

Ontario

Orangeville

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cspi
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