

Sunnyacres Rd - 400 m south of Front Rd to Front Rd (parallel)

	Local Sanitary Sewer	Local Water	Trunk Water
Diameter	200 mm	150 mm	900 mm
Wall Thickness	UNK	38 mm	81 mm
Material	Asbestos Cement	Cast Iron	Hyprescon
Product	Sewage	Water	Water
Pressure	0	< 150 psi	< 150 psi

Front Rd Intersection (parallel)

	Local Sanitary Sewer	Trunk Water
Diameter	200 mm	900 mm
Wall Thickness	UNK	81 mm
Material	Asbestos Cement	Hyprescon
Product	Sewage	Water
Pressure	0	< 150 psi

Front Rd Intersection (crossing)

	Local Water	Trunk Sewer	Storm Sewer	Forcemain
Diameter	300 mm	900 mm	400 mm	900 mm
Wall Thickness	28 mm	119 mm	UNK	75 mm
Material	Ductile Iron	Rienforced Concrete	UNK	HDPE
Product	Water	Sewage	Storm water	Sewage
Pressure	< 150 psi	0	0	< 150 psi

Field - 400 m south of Bath Rd (crossing)

	Local Sanitary Sewer	Trunk Sewer
Diameter	450 mm	900 mm
Wall Thickness	UNK	119 mm
Material	Asbestos Cemet	Rienforced Concrete
Product	Sewage	Sewage
Pressure	0	0

Bath Rd (parallel)

	Local Water
Diameter	250 mm
Wall Thickness	16 mm
Material	PVC
Product	Water
Pressure	< 150 psi

Bath Rd (crossing)

	Local Sanitary Sewer	Local Water	Storm Sewer
Diameter	200 mm	250 mm	450 mm
Wall Thickness	UNK	16 mm	UNK
Material	Asbestos Cement	PVC	Steel Culvert
Product	Sewage	Water	Storm water
Pressure	0	< 150 psi	0

Temporary Construction Area - Bath Rd north to Rail (crossing)

	Local Water
Diameter	300 mm
Wall Thickness	38mm
Material	Cast Iron
Product	Water
Pressure	< 150 psi

- Notes: 1. All wall thicknesses are estimates from current and historic tables attached.
2. Coating system, Cathodic Protection, Grounding facilities do not apply for the above pipelines
3. Appurtenances are unknown for the above pipelines

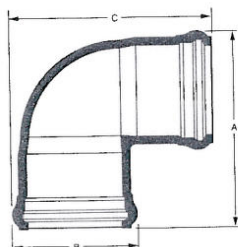
Dimensions:

Blue Brute pipes and fittings are manufactured with cast iron outside diameters (CIOD), which means that they are compatible with much of the existing infrastructure of older iron pipes. This means that no special transition fittings are needed with Blue Brute.

		*Class 100 (DR25)						Class 150 (DR18)						Class 200 (DR14)					
Size		Avg. ID		Min. Wall Thickness		Avg. OD		Avg. ID		Min. Wall Thickness		Avg. OD		Avg. ID		Min. Wall Thickness		Avg. OD	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
4	100	4.42	112	0.192	5	4.80	122	4.27	108	0.267	7	4.80	122	4.11	104	0.343	9	4.80	122
6	150	6.35	161	0.276	7	6.90	175	6.13	155	0.383	10	6.90	175	5.91	149	0.493	13	6.90	175
8	200	8.33	212	0.362	9	9.05	230	8.05	204	0.502	13	9.05	230	7.76	198	0.646	16	9.05	230
10	250	10.21	260	0.444	11	11.10	282	9.87	250	0.616	16	11.10	282	9.51	242	0.793	20	11.10	282
12	300	12.15	309	0.527	13	13.20	335	11.73	297	0.733	19	13.20	335	11.31	287	0.943	24	13.20	335

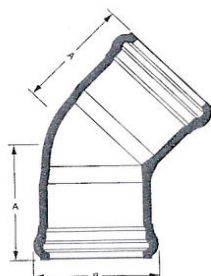
* Pressure class includes a 2.5:1 safety factor and a 2 ft/s surge allowance.

90° Elbow



SIZE		A		B		C	
in	mm	in	mm	in	mm	in	mm
4	100	10.14	257	6.25	159	10.14	257
6	150	13.90	353	8.88	226	13.90	353
8	200	16.90	430	11.36	289	16.90	430

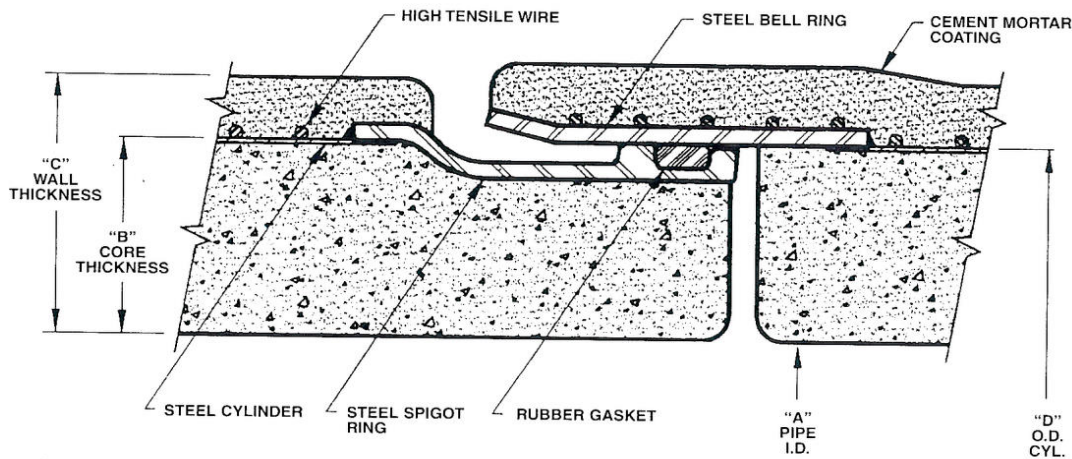
45° Elbow



SIZE		A		B	
in	mm	in	mm	in	mm
4	100	5.63	143	6.27	159
6	150	7.56	192	8.80	225
8	200	8.80	224	11.30	287

HYPRESCON PIPE

Prestressed Concrete Lined Cylinder Pipe - AWWA C301 (L)



Description:

The pipe is manufactured according to AWWA Standard C301 "Prestressed Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids".

The pipe consists of: a welded steel cylinder with sized steel joint rings welded to the ends and hydrostatically tested, a centrifugally placed concrete lining, circumferential prestressing wires helically wrapped (under constant tension) directly on the steel cylinder, and a dense cement-mortar coating over the prestressing wire and steel cylinder.

Prestressed concrete lined cylinder pipe is manufactured in sizes from 600mm to 1350mm diameter, in nominal lengths of 7315mm.

Design:

The pipe is designed to AWWA C304, "Design of Prestressed Concrete Cylinder Pipe".

The design of this pipe is based on rigid pipe theory in which specific combinations of internal pressures and external loads required for the project are fully considered.

The allowable height of fill, and the maximum design pressure for each class of pipe from 600mm to 1350mm are given in the design tables on the following pages for the installation conditions indicated. Pipes of higher classes can be designed.

Surge Pressure

Unless specifically mentioned, the pipe provides an additional surge pressure capacity of 40% of the pipe class pressure. For example, a class 20 pipe has a total capacity (working pressure and surge pressure) of 280 psi (1931 kPa). Other surge pressure allowances can be used.

Hydrostatic testing:

For AWWA C301 pipe, Hyprescon Inc. recommends a field test pressure of 120% of the operating pressure as per the AWWA M9 manual. An excessive test pressure increases the cost of the project.

NOMINAL PIPE DIAMETER mm	"A" ACTUAL PIPE I.D. mm	"B" CORE THICKNESS mm	"C" WALL THICKNESS mm	"D" O.D. CYLINDER mm	APPROX. WEIGHT kg/m
600	610	38	62	686	356
750	762	48	72	857	504
900	914	57	81	1029	675
1050	1067	67	91	1200	872
1200	1219	76	100	1372	1091
1350	1372	86	110	1543	1345

Manufactured length = 7315mm

SECTION 3

Table 3.3 Dimensions and Approximate Mass of Concrete Pipe

CSA A257.2M - Reinforced Concrete Culvert, Storm Drain, Drain and Sewer Pipe, Bell and Spigot				
Nominal Internal Diameter mm	WALL B		WALL C	
	Minimum Wall Thickness mm	Approx. Mass kg/m	Minimum Wall Thickness mm	Approx. Mass kg/m
300	50	162		
375	57	216		
450	63	253		
525	69	327		
600	75	430	94	545
675	82	500	100	625
750	88	598	107	708
825	94	695	113	821
900	100	832	119	973
975	113	923	125	1090
1050	117	1057	132	1207
1200	125	1324	144	1504
1350	138	1589	157	1798
1500	150	1927	169	2192
1650	163	2295	182	2582
1800	175	2695	194	2998
1950	188	3125	207	3586
2100	200	3585	219	3958
2250	213	4078	232	4494
2400	225	4598	244	4993
2550	238	5179	257	5595
2700	250	5752	269	6190
3000	279	6344	298	7401
3600	330	9921	349	9117

Note: This Table is based on concrete having a density of 2400 kg/m^3 .
Actual unit masses will vary depending upon concrete density.

Elliptical Concrete Pipe

Elliptical pipe, installed with the major axis horizontal or vertical, represents two different products from the standpoint of structural strength, hydraulic characteristics and type of application. Table 3.4 includes the dimensions and approximate weights of elliptical concrete pipe.

PRESSURE CLASS DUCTILE IRON PIPE

The ANSI/AWWA C150/A21.50 Standard and the ANSI/AWWA C151/A21.51 Standard were revised in 1991 to incorporate a PRESSURE CLASS designation for Ductile Iron Pipe and to designate the previous thickness classes as SPECIAL CLASSES.

Although the terminology has been changed from "thickness class" to "pressure class", neither the pipe design requirements of ANSI/AWWA C150/A21.50 nor the pipe manufacturing requirements of ANSI/AWWA C151/A21.51 have been changed.

The standard internal lining for Ductile Iron Pipe is Cement Mortar Lining to ANSI/AWWA C104/A21.4. The Cement Mortar Lining provides a realistic Hazen-Williams flow coefficient of C=140, which is maintained over the life of the pipe.

The ANSI/AWWA C104/A21.4 Standard may be revised in 1995 to allow the lining to be supplied either with or without the asphalt seal coat. Unless specified by the purchaser, the asphalt sealcoat may not be applied.

PRESSURE CLASS DUCTILE IRON PIPE OFFERS:

- **the same** conservative design method used since 1976
- **the same** safety factors and surge allowances included in the design
- **the same** ability to be directly tapped safely and securely
- **the same** bottle-tight, easy to assemble, push-on joint
- **the same** joint deflection to accommodate curves and grade changes
- **the same** larger than nominal inside diameter that results in substantially lower head losses and pumping costs than any other pipe.

Available Pressure Classes

Size		Outside Diameter		PC 150		Nominal Thickness															
						PC 200		PC 250		PC 300		PC 350									
<i>in</i>	<i>mm</i>	<i>in</i>	<i>mm</i>	<i>in</i>	<i>mm</i>	<i>in</i>	<i>mm</i>	<i>in</i>	<i>mm</i>	<i>in</i>	<i>mm</i>	<i>in</i>	<i>mm</i>								
4	100	4.80	121.9									.25	6.4								
6	150	6.90	175.3									.25	6.4								
8	200	9.05	229.9									.25	6.4								
10	250	11.10	281.9									.26	6.6								
12	300	13.20	335.3									.28	7.1								
14	350	15.30	388.6									.28	7.1	.30	7.6	.31	7.9				
16	400	17.40	442.0									.30	7.6	.32	8.1	.34	8.6				
18	450	19.50	495.3									.31	7.9	.34	8.6	.36	9.1				
20	500	21.60	548.6									.33	8.4	.36	9.1	.38	9.7				
24	600	25.80	655.3									.33	8.4	.37	9.4	.40	10.2	.43	10.9		
30	750	32.00	812.8									.34	8.6	.38	9.7	.42	10.7	.45	11.4	.49	12.4
36	900	38.30	972.8									.38	9.7	.42	10.7	.47	11.9	.51	13.0	.56	14.2

- Pressure Classes shown have an additional 100psi allowance for surge.
- Dimensions are subject to manufacturing tolerances.

TABLE 6.3 (contd.)				
STANDARD THICKNESSES AND WEIGHTS OF PIPE CENTRIFUGALLY CAST IN METAL MOLDS*				
Size	Thickness	Outside Diam.	Weight Based on 16-ft. Laying Length	
			Avg. Per Foot†	Per Length‡
<i>in.</i>			<i>lb.</i>	
Class 350 — 350-psi. Pressure — 808-ft. Head				
4	0.35	4.80	16.2	260
6	0.38	6.90	25.9	415
8	0.41	9.05	37.3	595
10	0.52	11.10	57.3	915
12	0.56	13.20	73.5	1175
14	0.64	15.65	99.2	1585
16	0.68	17.80	120.2	1925
18	0.79	19.92	157.2	2515
20	0.84	22.06	185.4	2965
24	0.92	26.32	243.3	3895

* These thicknesses and weights are for pipe laid without blocks, on flat-bottom trench, with tamped backfill, under 5 ft. of cover. For other conditions, see Tables 6.2 and 6.4 hereof and ASA A21.1, "Manual for the Computation of Strength and Thickness of Cast Iron Pipe."

† Average weight per foot based on calculated weight of pipe before rounding.

‡ Including bell. Calculated weight of pipe rounded off to nearest 5 lb.

Table 9A

Polyethylene Pipe- Straight Lengths

For ASTM F714 & AWWA C906

Sclairpipe

DIPS DR

Dimensions in millimetres

NPS (Inches)	OD avg (Inches)	Max OD mm	Min OD mm	Wall thickness (in mm)												DR 32.5		DR 26		DR 21		DR 17		DR 15.6		DR 13.5		DR 11		DR 9.3		DR 9		DR 7.3	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
3	3.96	100.99	100.18			9.87	4.33	4.79	6.36	5.92	6.63	6.49	7.27	7.45	8.34	9.14	10.24	10.82	12.11	11.18	12.62	13.78	16.43												
4	4.8	122.48	121.36			4.69	5.25	5.81	6.50	7.17	8.03	7.87	8.81	9.03	10.11	11.08	12.41	13.11	14.68	13.55	15.17	16.70	18.71												
6	6.9	176.05	174.47	5.39	6.04	6.74	7.55	8.35	9.35	10.31	11.55	11.31	12.66	12.88	14.54	15.93	17.84	18.85	21.11	19.47	21.81	24.01	26.89												
8	8.05	200.91	228.83	7.07	7.82	8.84	9.90	10.95	12.26	13.52	15.14	14.89	16.61	17.03	19.07	20.90	23.40	24.72	27.68	25.54	28.61	31.49	35.27												
10	11.1	283.21	280.67	8.69	9.72	10.84	12.15	13.43	15.04	16.58	18.57	18.19	20.37	20.88	23.39	25.63	28.71	30.32	33.95	31.33	35.09	38.62	43.26												
12	13.2	336.78	333.78	10.32	11.55	12.80	14.44	15.97	17.88	19.72	22.09	21.63	24.23	24.84	27.82	30.48	34.14	36.05	40.38	37.25	41.72	45.93	51.44												
14	15.3	390.37	386.87	11.96	13.39	14.95	16.74	18.51	20.73	22.86	25.60	25.07	28.08	28.78	32.24	35.33	39.57	41.79	46.80	43.18	48.36	53.24	59.62												
16	17.4	443.94	439.88	13.60	15.23	17.00	19.04	21.05	23.57	26.00	29.12	28.51	31.84	32.74	36.87	40.18	45.00	47.52	53.23	49.11	55.00	60.54	67.81												
18	19.5	497.54	493.08	15.24	17.07	19.05	21.34	23.59	26.42	29.14	32.63	31.95	35.79	36.69	41.09	45.03	50.43	53.26	59.65	55.03	61.64														
20	21.6	551.10	548.18	16.88	18.91	21.10	23.63	26.13	28.26	32.27	36.15	35.40	39.64	40.64	45.62	49.88	55.86	58.99	66.07	60.96	68.28														
24	25.8	658.27	652.37	20.16	22.58	25.20	28.23	31.21	34.95	38.55	43.17	42.28	47.35	48.54	54.37	59.57	66.72	70.46	78.92																
30	32	816.46	809.14	25.01	28.01	31.26	35.01	38.70	43.35	47.81	53.55	52.44	58.79	60.21	67.43	73.89	82.78																		
36	38.3	977.19	968.45	29.93	33.52	37.42	41.91	46.32	51.89	57.22	64.09	62.76	70.29																						
42	44.5	1135.36	1126.22	34.78	38.95	43.47	48.69	53.82	60.28	66.49	74.47																								
48	50.8	1296.14	1284.50	39.70	44.47	49.63	55.58	61.44	68.82	75.90	85.01																								
54	57.1	1456.87	1449.81	44.53	49.88	55.78	62.48	68.06	77.35																										

Notes: Minimum and maximum outside diameter of DIPS Sclairpipe is per applicable standard