

NW Norwood Waterworks

Orientation Manual

Work Hard, Play Hard

Updated July 2018 by Tyrell Scott



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Reading a “Picker”

There are a few key sections on a picker that need to be understood in order to fulfill an order from start to finish:

- In the top right is the invoice number that usually indicates the PO number. This is important to know in order to reference the order in TREND so that our project managers can adjust any discrepancies or contact the customer if needed. At the end of the number there will be a “XX” or “00,” “01,” etc. This will indicate whether the order is a **ship complete** or not.
- In the top centre column is a “requires by” date and a phone number. These are both important in prioritizing when an order needs to be completed and shipped, as well as whom to contact when confirming delivery information.
- Just below that information is the “ship to” information which will tell you where to take the product if and when we are to deliver it.
- Directly above the product line items is a shaded box with “special instructions.” Look here to see if there is anything you need to be aware of. This area usually has information such as which courier to use or what time the customer needs the product by.
- On the line items there are several categories:
 - “**LN**” stands for line and indicates what line on the order (in TREND) the item is.
 - “**SKU code**” will give you the product number of that specific item in TREND.
 - “**Bin Loc**” is the bin location of the item in the warehouse or yard. New part and Non stock mean that item does not have a location.
 - “**Description**” will give you the TREND description of the item.
 - “**UOM**” (unit of measure) will give you the measurement the product is in. For example, “EA” means each, “ME” means metres, “FT” means foot, and “CFT” means per 100 feet.
 - “**Ordered**” will tell you how many of each item the customer ordered.
 - “**Shipped**” will tell you how many items are available to be picked.
 - “**B/O**” will tell you how many items that are backordered and are waiting to come in for the order.
- When you have completed picking the order you must put in the date you picked it into the “**Date**” box in the bottom as well as your name in the “**Picked By**” box.

ALL NORWOOD WATERWORKS PICKERS ARE **DOUBLE CHECKED**, THEREFORE YOU WILL ALWAYS SEE TWO SIGNATURES AT THE BOTTOM OF EVERY PICK TICKET. IT IS VERY IMPORTANT THAT ALL ORDERS ARE DOUBLE CHECKED TO ACHIEVE A ZERO ERROR SHIPPING RATE.



A Division of EMCO Corporation
 285177 WRANGLER AVENUE
 ROCKYVIEW, AB T1X 0P3
 Ph: (403)203-2553
 Fax: (403)203-2533

Br.: 735 Whse: 735

Requires By: 11/03/14
 Contact Name:
 Contact#:

GST/HST: R101626026

Invoice Number 3518767-00
Customer P.O. Number 0000178

Date/Time Printed
11/04/14 15:37 MST

PICKER # 1

Bill To:

Cust.No. 300470
 Phone No. (403)228-3421

Ship To:

NORTH STAR CONTRACTING INC
 5305-32nd AVE SW
 CALGARY, AB T3S 0B9

ADDRESSES
 NORTH STAR CONTRACTING INC
 64 TECHNOLOGY WAY SE
 CALGARY, AB T3S 0B9

Date/Time Ordered
11/03/14 14:28

Shipped

PPD	COL	PPD/ADD
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Special Instructions Please stage for this week

Ref.:

Line	SKU	Bin Loc	Description	UOM	Ordered	Shipped	B/O	List	%	Net
1	6530900	I06	5LB ZINC ANODE PKG ZN5	EA	5	5				
2	6535291	I07	12LB ZINC ANODE PKG ZN12	EA	3	3				
3	6521235	C07	12 421 T/BT STL CATH CPLG 1367	EA	1	1				
4	6533888	YARDG	12x8 DI TYT RED CTD	EA	1	1				
5	6567222	YARDC	150MM ROYAL DR18 C900 PP 6.1M	ME	54.9	54.9				
6	6567223	YARDC	200MM ROYAL DR18 C900 PP 6.1M	ME	140.3	140.3				
7	6567225	YARDC	300MM ROYAL DR18 C900 PP 6.1M	ME	6.1	6.1				
8	6560026	A08	150MM PVC C900 90 ELL B-B	EA	2	2				
9	6560027	A02	200MM PVC C900 90 ELL B-B	EA	2	2				
10	6560023	A01	200x150MM PVC C900 TEE B-B-B	EA	2	2				
11	6560650	A09	200x150MM PVC C900 BUSH SPG-B	EA	1	1				
12	6542905	YARDJ	11'0 M67 OL HYD 2H 1P CTD	EA	1	1				
13	6540692	YARDB	CONC HYD SLAB	EA	1	1				
14	6043100	YARDC	100MM ROYAL DR35 SWR PP 4.27M	ME	64.05	64.05				
15	6043101	YARDC	150MM ROYAL DR35 SWR PP 4.27M	ME	29.89	29.89				
16	6043102	YARDC	200MM ROYAL DR35 SWR PP 4.27M	ME	76.86	76.86				
19	0578849	I13	2x100 MUNICIPEX PIPE	FT	500	500				
20	6513957	D01	2 FB1000-7Q-NL MAIN STP CC	EA	3	3				
21	6514569	D15	2 QJN4-7TW TRACER/ANODE NUT	EA	3	3				
22	6513948	D09	2 B44-775WQ-NL BALL S&W QJ	EA	3	3				
23	6543248	YARDG	CCSB2 8-10' CGY SERV BOX W/8'	EA	3	3				
24	6500018	E11	PLST CURB STOP BLOCK	EA	3	3				
25	0352313	YARDE	6 TYT 20080R GATE VLV OR CTD	EA	3	3				
26	0352314	YARDE	8 TYT 20080R GATE VLV OR CTD	EA	1	1				

BILLED NOV 7 3 2014

Staging Area _____	Pipe _____	Bags _____
Boxes _____	Skids _____	Crates _____
Other _____		

9 pcs 150mm ROYAL
 1 pc 300mm C900 ROYAL
 15 pcs 100mm DR35 ROYAL
 7 pcs 150mm DR35 ROYAL
 18 pcs 200mm DR35 ROYAL

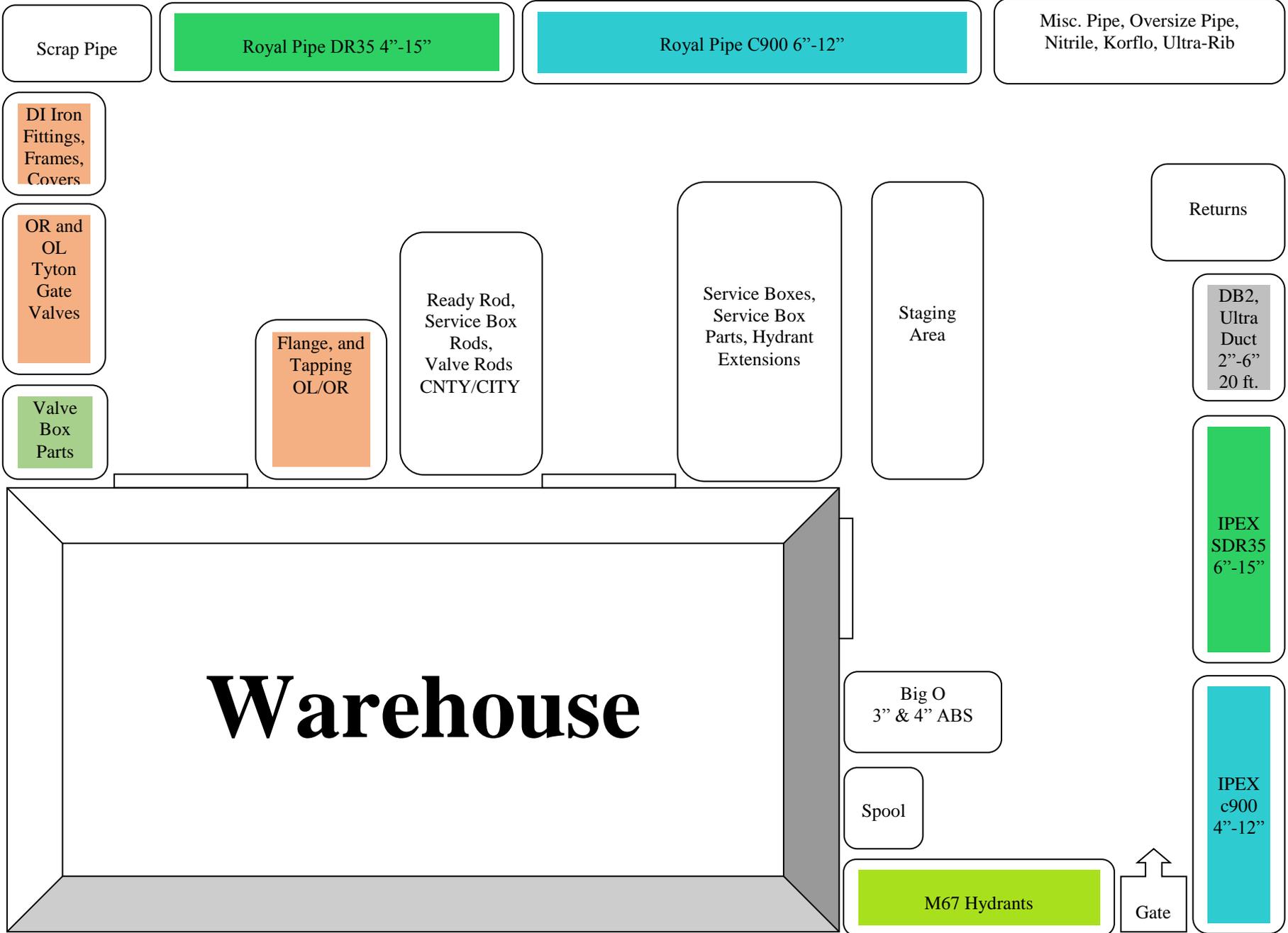
Taken By saw - Scott Wintemute	Placed By Matt
Sales Rep. js-Joey Sleno OAM 735	Freight
Bill of Lading # 002222	Date Picked Nov 6/14
Picked By AR	Weight 9821.6
Via OUR TRACK	Date Shipped
Page 1 Continued	

NO RETURNS ALLOWED ON SPECIAL ORDERS WITHOUT PERMISSION
 2% PER MONTH (24% PER ANNUM) SERVICE CHARGE ON ALL OVERDUE ACCOUNTS.
 Customer's Signature _____ Customer's Name(Printed) _____
 Branch Copy
 O.S.T. REGISTRATION NO. R101626026

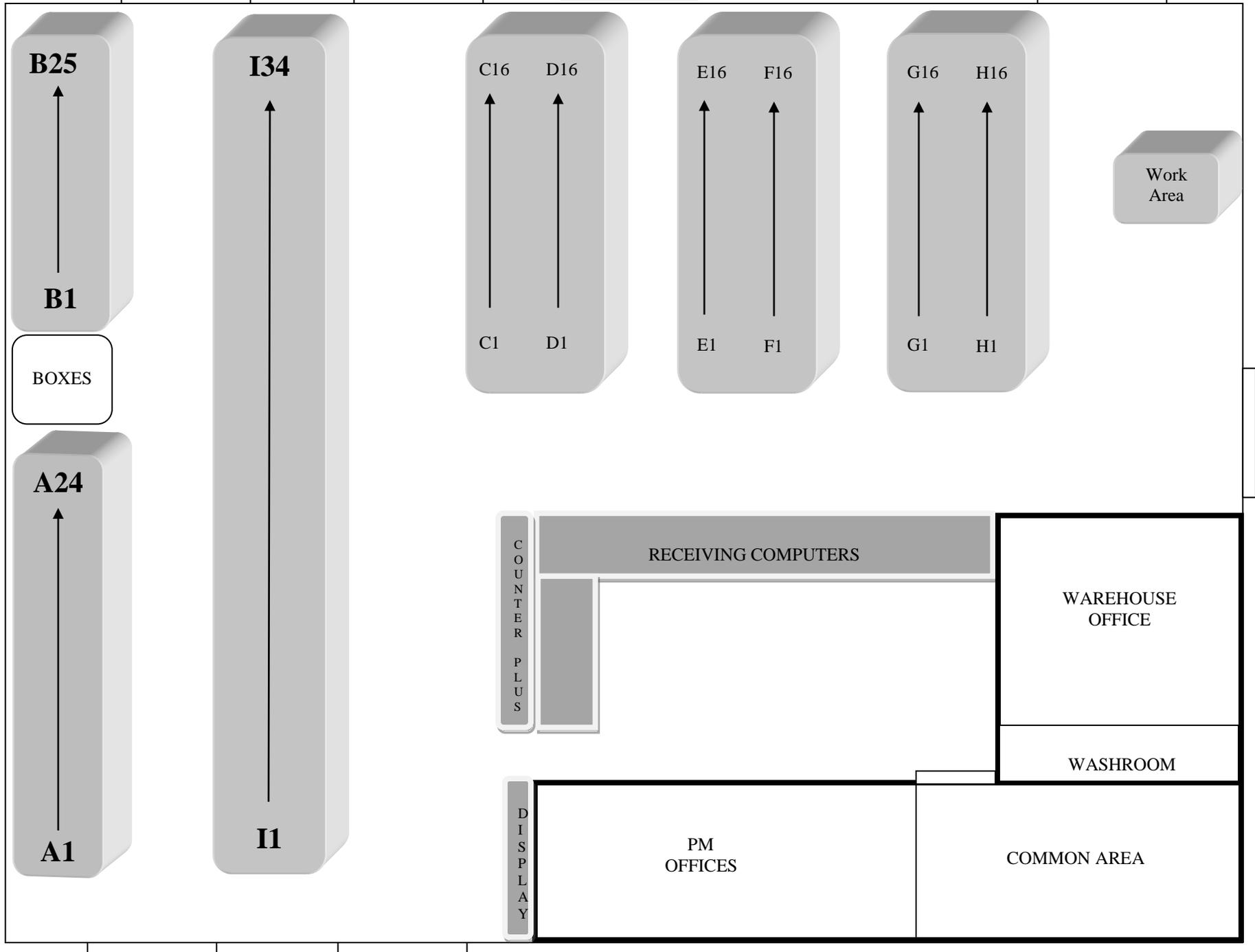
Good Points to Know!

- Always wear hard-toed shoes, pants (not shorts), and Norwood safety coveralls when working in the yard.
- When dealing with pipe sizes, pipe diameter is commonly referred to in inches rather than millimeters. A good rule of thumb is that **25mm = 1"**.
- When looking in trend, pipe quantity is always specified in total length. (ie. 6 pcs of 4M pipe = 24 qty)
- **Always supply TYT gaskets** when shipping gate valves with Hub / push on / TYT connections.
- Norwood supplies free lube to any customer that purchases pipe.
- UltraRib fittings always require a gasket for each end.
- Service Boxes must always include a cotter pin of appropriate size.
- Never leave anodes outside or where they can possibly get wet. Anodes are activated once exposed to moisture and can release hydrogen gas that can present a serious fire risk.
- SDR and UltraRib fittings can look very similar. To better differentiate, note that UltraRib ends have edges, which almost always bell outwards.
- Copper coils often come in boxes, which carry several coils. It is important to be cognizant of this and pick the appropriate amount and not an entire box.
- Most Cast Iron / Ductile Iron fittings and all PVC pipe have their size printed on their side. When in doubt, look for these markers, or ask a teammate for assistance.
- A "dipped" cast iron product means that it has had a black paint coating / epoxy coating applied to it, while "undipped" signifies that it has no treatment
- Make sure to check if applicable hardware is accompanied with any product that belongs with it.

Yard



Warehouse



Pipe

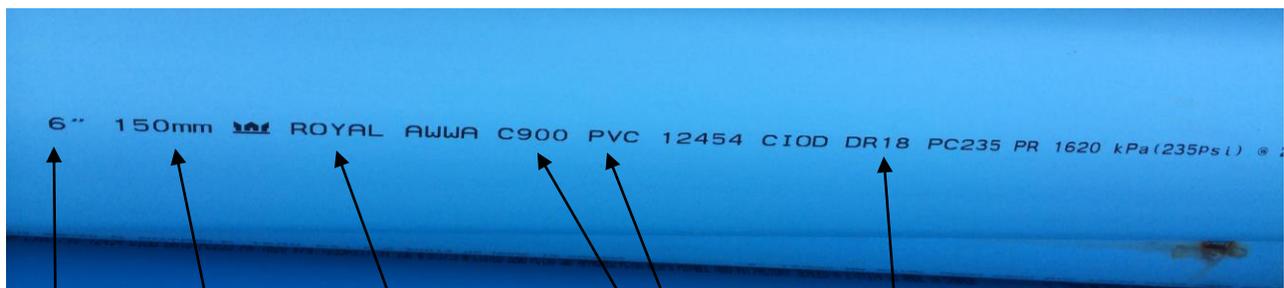
C900 (Water) Pipe:

-This pipe is blue in colour and is used for the transportation of potable water. Norwood Waterworks stocks sizes from 4" – 12" diameters. 4" Diameters are stocked in DR14, a thicker wall to ensure consistent strength and pressure ratings. It is designed to handle pressurized water, and therefore has thick walls / is the heaviest type of PVC pipe Norwood stocks.

-Larger diameter DR18 pipe (14" – 24") is available, but is typically only brought in as a special order. These larger sizes are often referred to as C905 rather than C900.

-Interesting Fact: The Outside Diameter (OD) of C900 pipe is the same as Cast Iron OD. This allows C900 pipe to fit into Cast Iron (CI) and Ductile Iron (DI) fittings such as tees, crosses, and bends. This is useful, as some sharp-angled bend fittings, crosses, and substantial reduction fittings (ie going from 12" to 6") are only available in CI/DI due to pressure limitations of PVC. IPEX has introduced C907 PVC fittings available in 250mm and 300mm sizing to substitute the use for CI. The large diameter PVC fittings last longer, are lighter, and do not require the use of an anode.

For comprehensive training on PVC pipe construction, and how to properly install visit: <http://www.ipexinc.com/Content/Training>



SIZE
INCHES

SIZE
MM

MANUFACTURER

TYPE

DIMENSIONAL
RATIO

Blue Brute Pipe

4" - 12" (100mm - 300mm)

Designed for municipal applications, Blue Brute® systems deliver superior strength with corrosion resistant performance and the ability to flex without damage. IPEX municipal pressure piping systems are made with a high-strength, high-impact PVC compound, allowing them to perform even under high traffic loads and deep burial conditions.



Corrosion-Proof Performance

IPEX Blue Brute systems are immune to corrosion from aggressive soils and galvanic action.

Superior Hydraulics

The glass-like finish of PVC reduces friction losses and eliminates the tuberculation common in iron pipes. As a result, pumping costs are reduced and water quality is maintained.

Cast Iron Outside Diameter (CIOD)

Blue Brute systems are manufactured with a cast iron outside diameter (CIOD). This is compatible with waterworks valves, appurtenances and restrainers.

Bottle-tight Joints, Removable Gaskets

IPEX's patented gasket system not only withstands many times the rated system pressure, but also withstands full vacuum pressures. The unique removable gasket system allows special oilresistant(nitrile) gaskets to be easily installed when working in contaminated soils.

Third-party Certification

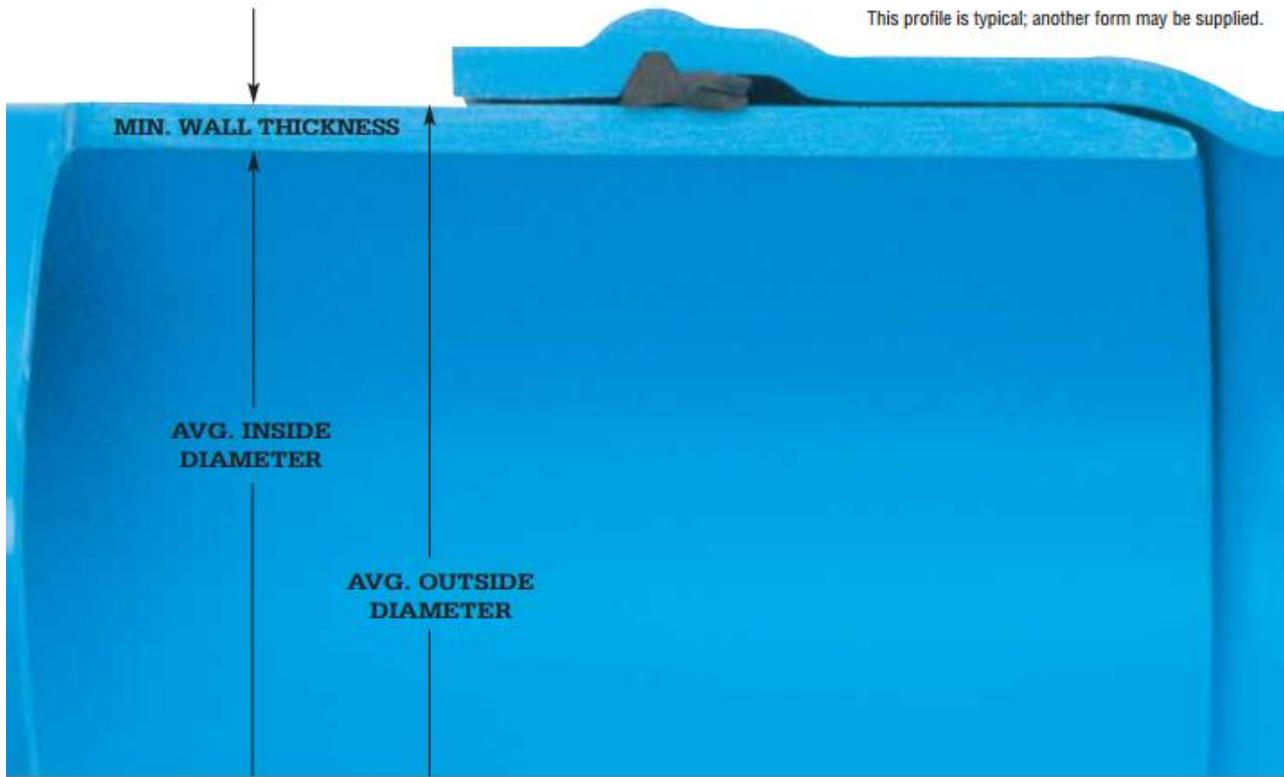
All IPEX municipal systems are third-party certified as applicable. In addition, IPEX Blue Brute systems have Factory Mutual approval and Underwriter's Laboratories (ULI and ULC) listings.

IPEX Blue Brute Pipe Specifications:

Dimensions in Millimetres			
Nominal Size	Avg. Inside Diameter	Min. Wall Thickness	Avg. Outside Diameter
Class 165 (DR25)			
100	112	5	122
150	161	7	175
200	212	9	230
250	260	11	282
300	309	13	335
Class 235 (DR18)			
100	108	7	122
150	155	10	175
200	204	13	230
250	250	16	282
300	297	19	335
Class 305 (DR14)			
100	104	9	122
150	149	13	175
200	198	16	230
250	242	20	282
300	287	24	335

Dimensions in Inches			
Nominal Size	Avg. Inside Diameter	Min. Wall Thickness	Avg. Outside Diameter
Class 165 (DR25)			
4	4.42	.192	4.80
6	6.35	.276	6.90
8	8.33	.362	9.05
10	10.21	.444	11.10
12	12.15	.527	13.20
Class 235 (DR18)			
4	4.27	.267	4.80
6	6.13	.383	6.90
8	8.05	.502	9.05
10	9.87	.616	11.10
12	11.73	.733	13.20
Class 305 (DR14)			
4	4.11	.343	4.80
6	5.91	.493	6.90
8	7.76	.646	9.05
10	9.51	.793	11.10
12	11.31	.943	13.20

Dimension Ratio (DR) is the outside diameter of the pipe divided by the minimum wall thickness.



SDR (Sewer) Pipe:

-This pipe is green in colour and is used for storm and sewage lines. Norwood Waterworks stocks sizes from 4" – 15" diameters. Larger diameter SDR35 is available (18" to 60") but is not commonly kept in stock. In comparison to C900, SDR35 is much thinner and lighter.

-Like C900, Norwood Waterworks stocks both IPEX SDR35 and Royal DR35.

-SDR is also available as SDR28, also referred to as CSA. It is not as commonly used in large diameters, but is engineer spec for sewer service line from buildings to the main sewer line. Norwood stocks SDR28/DR28 in 4".

-It is a gravity style pipe that is not pressurized. Pressurized, or commonly referred to as forced sewer main is constructed using SDR26.

Note: Royal DR35 pipe is now sold in 4.27M lengths while IPEX is sold in 4M.

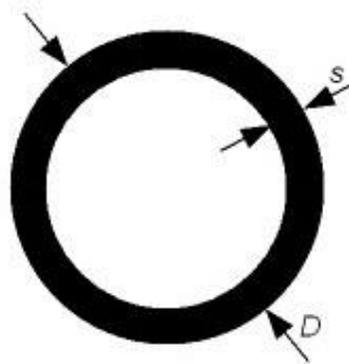
-The SDR is the ratio of pipe diameter to wall thickness and the SDR can be expressed as. $SDR = D / S$ where D = pipe outside diameter (mm, in)

Example: A SDR 11 means that the outside diameter - D - of the pipe is eleven times the thickness - s - of the wall.

-With a high SDR ratio the pipe wall is thin compared to the pipe diameter.

-With a low SDR ratio the pipe wall is thick compared to the pipe diameter.

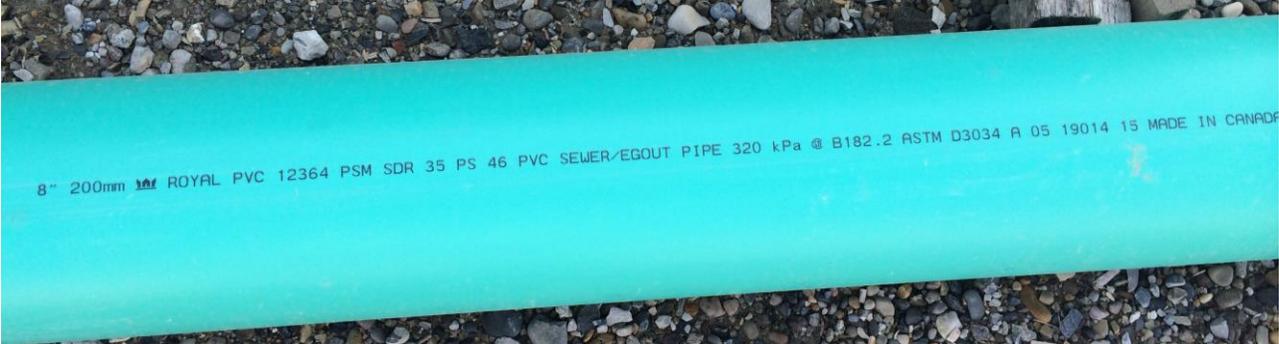
As a consequence a high SDR pipe has a low-pressure rating and low SDR pipe has a high-pressure rating.



Royal DR35 Pipe:

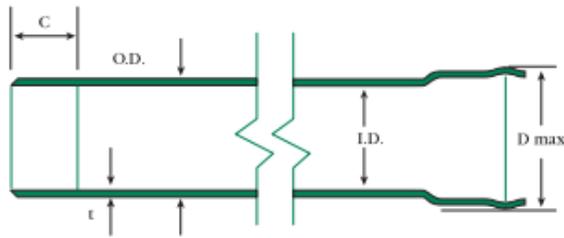


Royal DR35, 200mm pipe:



DIMENSIONS

1. Ring-Tite and Enviro-Tite



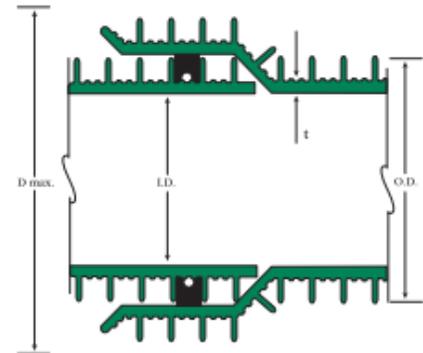
where, O.D. = average outside diameter
 I.D. = average inside diameter
 t = minimum wall thickness
 Dmax = approximate outside diameter of the bell
 C = insertion depth distance

Note: Bell profiles are for information only.
 Actual profiles may vary

Enviro-Tite available in all DR28 sizes & DR35 from 100 - 375 mm.

Pipe Size		O.D.		I.D.		t		Dmax		C	
mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
DR28											
100	* 4	107.1	4.22	99.0	3.90	3.8	0.15	135	5.31	71	2.8
125	* 5	143.3	5.64	132.5	5.22	5.1	0.20	173	6.81	72	2.8
150	* 6	159.4	6.28	147.3	5.80	5.7	0.22	191	7.52	89	3.5
DR35											
100	4	107.1	4.22	100.7	3.96	3.1	0.12	133	5.24	71	2.8
125	5	143.3	5.64	134.6	5.30	4.1	0.16	171	6.73	72	2.8
150	6	159.4	6.28	149.6	5.89	4.6	0.18	189	7.44	89	3.5
200	8	213.4	8.40	200.4	7.89	6.1	0.24	245	9.65	100	3.9
250	10	266.7	10.50	250.5	9.86	7.6	0.30	310	12.20	115	4.5
300	12	317.5	12.50	298.1	11.74	9.1	0.36	364	14.33	125	4.9
375	15	388.6	15.30	365.1	14.37	11.1	0.44	442	17.40	145	5.7
450	18	475.0	18.70	448.1	17.56	13.6	0.53	550	21.65	286	11.3
525	21	560.0	22.05	528.3	20.71	16.0	0.63	640	25.20	317	12.5
600	24	630.0	24.80	594.4	23.36	18.0	0.71	700	27.56	343	13.5
675	27	710.0	27.95	669.9	26.26	20.3	0.80	800	31.50	343	3.5
750	30	812.8	32.00	763.8	30.07	23.2	0.91	926	36.46	356	4.0
900	36	972.8	38.30	914.4	36.00	27.8	1.09	1108	43.62	406	6.0
1050	42	1130.3	44.50	1062.0	41.81	32.3	1.27	1265	49.80	406	16.0

2. Ultra-Rib



where, O.D. = average outside diameter of barrel
 I.D. = average inside diameter
 t = minimum waterway wall thickness
 Dmax = approximate outside diameter of bell

Pipe Size		O.D.		I.D.		t		Dmax	
mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
200	8	224	8.8	200	7.87	2.20	0.09	248	9.8
250	10	280	11.0	251	9.88	2.30	0.09	311	12.2
300	12	333	13.1	298	11.73	2.60	0.10	371	14.6
375	15	408	16.1	365	14.37	2.80	0.11	453	17.8
450	18	497	19.6	448	17.64	3.30	0.13	556	21.9
525	21	584	23.0	527	20.75	4.06	0.16	665	26.2
600	24	660	26.0	597	23.50	4.58	0.18	724	28.5

Ultra-Rib ▲ / Korflo ■ (Storm) Pipe:

-This pipe is green in colour and is used for storm lines. It differs from SDR in that it has ridges along the entire body of the pipe, which give it a “ribbed” look. This allows for added strength, almost as strong as SDR35/DR35, but much lighter. It also has a gasket built on the outside of the spigot end. Norwood Waterworks stocks sizes from 8” – 12” diameters. 15”-42” are also available, but are only brought in for special orders.

-IPEX produces Ultra-Rib, Royal produces Korflo

Korflo:



Royal Korflo 600mm:



Perforated Pipe:

-Perforated pipe can be made from a variety of PVC pipe, but perforated SDR35/DR35 is the most common stocked at Norwood in 100mm and 150mm sizes. Larger sizes can be custom made and are available to order if required by the customer. These pipes are typically used in drainage arrangements, where water is allowed to slowly move out of the pipe into surrounding drainage rock or gravel, etc. Perforated pipe does not have gaskets, it is a solvent weld connection. The pipes have a bell and spigot that is held together using primer and solvent glue to keep it in place, and sealed from water and debris.

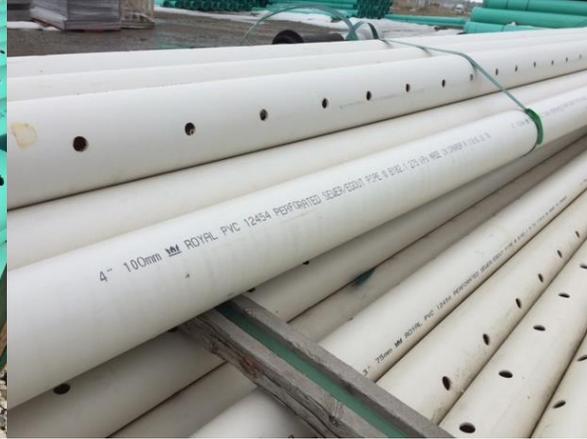
-IPEX and Royal both produce perforated pipe, and once again, royal comes in 4.27m lengths.

-Depending on the application, a “filter sock” is sometimes provided along with the perf pipe. This fabric tube fits over the perf pipe, and prevents the back flow of ground sediment or dirt into the pipe. These socks are available in multiple sizes, and Norwood stocks a small amount of 6” sock, with other sizes available.

Royal DR35 100mm Perf Pipe



Royal 100mm DR28 Perf Pipe



Filter Sock:

-Filter sock is a fabric tube that fits over the perf pipe to prevent the back flow of ground sediment or dirt into the pipe causing a blockage. These socks are available in multiple sizes, and Norwood stocks a small amount of 6" sock, with other sizes available. It comes in rolls typically 55m lengths, and slips over the perforated pipe during installation.

-Some customers will request filter sock when installing perforated pipe. It depends on the soil conditions, and engineer specifications for the job. Filter sock can be ordered from Nilex, or Brock White in Calgary, and is usually available at short notice if a customer request a size we do not stock.



Filter Fabric:

Similar to filter sock, filter fabric is also used to keep dirt and debris from entering the perforated pipe. It is used to line the walls of the trench around the bottom, sides, and top of the pipe. It is not stocked at Norwood Waterworks, but is available to customers upon request. Most customers prefer to use pipe sock, as it is quicker to install, and more efficient at keeping debris from entering the pipe.



Ultra Duct / DB2 Conduit / Hydroduct:

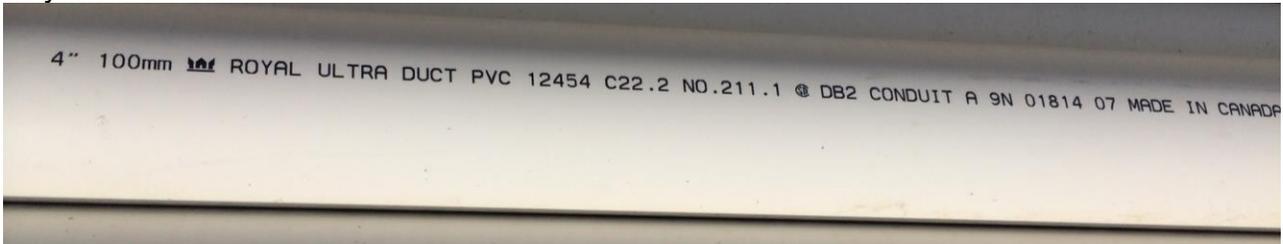
-Ultra Duct / DB2 / Hydroduct / is a conduit pipe sold in 10 foot and 20 foot lengths used to protect buried wires from water, dirt, and corrosion. Norwood Stocks 2", 3", 4" and 6" sizes. This conduit pipe does not have gaskets like standard SDR35 and C900. It is a bell and spigot push on style that uses primer and solvent glue to bond the pipe together.

-Ultra duct and DB2 comes in both white and black, and has no difference in construction or usage, just colour.

Royal 100mm DB2:



Royal 100mm Ultra Duct:



ABS Pipe:

- Acrylonitrile butadiene styrene (ABS) pipe is commonly used in drain-waste-vent pipe systems and sewer systems. It is also sometimes used as electrical insulation.

-Norwood stocks ABS pipe in 3", 4" & 6" diameters and each are 12 feet in length.

-ABS is easier to install compared to PVC pipes, but also more likely to deform when exposed to the sun.

-ABS piping has a higher impact strength than PVC, especially at lower temperatures.

ABS Pipe



Pipe Lubricant:

-Pipe lubricant is used when joining two pieces of pipe together or joining pipe to a fitting. It is used for all types of stocked PVC pipe.

-As a general rule of thumb, **1kg of pipe lubricant** is included per each lift / crate of pipe. We stock both 1kg and 4kg containers of lube in IPEX and Royal brands. Pipe lube is food grade and can be safely used on c900 potable water pipe. Pipe lube is given free to any customer that purchases PVC pipe from Norwood Waterworks. Pipe lube is also sold to customers that require additional lube beyond what is included with the pipe purchase, and is sometimes ordered in large quantities if lots of PVC fittings are installed with the pipe.

1KG Royal and 4KG IPEX Pipe Lube:



High-Density Polyethylene (HDPE) CSA 200 Piping (municipal services)

-These tubes come in black coils of different lengths up to 1000 ft, most commonly in multiples of 100 ft. The size can be found printed along its length. They are available in ¾", 1", 1¼", 1½", and 2" diameters. Our Sister company **Sandale** specializes in HDPE stick pipe and fusible PVC used for certain applications.

-HDPE is UV resistant and has no expiry date



Big-O / Drainage Tubing and EZ-Flow:

Used as storm water drainage tubing buried often around buildings to collect and channel run off water. Big-O drainage tubing is very similar to SDR perf pipe in application. It comes in coils and is stocked in 4" sizes. Norwood stocks only big-O that is wrapped with pipe sock.

-It is buried shallow in the ground, and is surrounded by gravel to allow the water to enter the pipe and be channeled to an appropriate drainage spot.

Big-O / Drainage Tubing



PEX Water Service Tube:

-These tubes come in blue coils. They come in 100 ft. and 300 ft. rolls, and ¾", 1", 1.5" and 2" diameter sizes.

-Pex tubing is connected by using either crimp rings and brass fittings, or quick joint applications with stainless steel inserts. With quick joint connections, a stainless steel insert is placed inside the pex tubing to prevent it from crushing, or warping when the quick joint compresses around the outside of the pex tubing.

-Pex tubing is stocked at Norwood by both Rehau and IPEX, however most customers prefer to use Rehau.

-PEX is typically shipped in boxes, so care should be taken to note the box label. The pex sizing, and lengths can be found on the box label, and by reading the outside of the pex tubing.



-Norwood also stocks and sells Rehau Raupex. It looks similar to Municipex except that it is white in color.

Cert K Soft Copper Tubing:

-Cert K soft copper comes in both coil and linear lengths. Norwood Waterworks stocks very little soft copper tubing. We currently stock $\frac{3}{4}$ " & 1" coils in 66' lengths as well as 1" in 100' lengths.

-Soft copper tubing was traditionally used for water services, but has recently been replaced by pex tubing due to price, ease of installation, and durability.

-Cert K soft copper is typically shipped in boxes, so care should also be taken to note the box label. 66 ft roll boxes will often have two rolls of copper in a box, so ensure you ship the right amount!



-Norwood also stocks and sells copper tubing in 20 foot lengths in 1 ½" and 2" sizes.

Guide for Reading Pipe Date Codes

Pipe manufacturers apply date codes to each piece of pipe to ensure that consumers know when certain pipe will expire. This is important to know so that you do not send out expired pipe to a customer.

Sometimes pipe may look fine but make sure to always check the date code to be positive the pipe is in date.

Here are a couple examples from the 2 major manufacturers of pipe date codes.

Royal

Example: H2 11614 17 *Made in Canada*

116 – This is the three digit code for the day when the pipe was manufactured. In this case, it is the 116th day of the year (April 26th). Another example: **H2 02414 17 *Made in Canada*** would be the 24th of January.

14 – Year manufactured (2014)

17 – Line # manufactured

IPEX

Example: H-130203081008M

13 – Year Made (2013)

02 – Month Made (February)

03 – Day Made (3rd)

08 – Hour Made (8AM)

10 – Minute Made (10 minutes after the hour)

08 – Line #

M – Pressure Compound

Pipe Exam

1. DR18 pipe is also commonly referred to as ____?
2. What are the lengths of pipe that Norwood sells in the following DRs?
18 ____
28 ____
35 ____
3. Convert the following pipe sizes into inches;
100MM ____
250MM ____
525MM ____
4. What are the 2 main manufacturers of pipe that Norwood sells?
5. Ultra-Rib & Korflo pipe are most commonly used in what application?
a) Water
b) Sewer
c) Storm
6. What product would you typically sell along with perforated pipe?
7. What sizes of HDPE rolls does Norwood stock/sell?
8. Rehau Municipex pipe is sold in what sizes/lengths?
9. Copper tubing is only sold in coils/rolls.
T or F
10. What do the highlighted numbers represent in the following pipe date code?

H-160305081008M

C900, SDR, UltraRib and Korflo Fittings:

This section will cover the various types of fittings we carry and show you how to differentiate between them. For example, the “TREND Example” provided BELOW would tell us that the fitting we need is made to be put on a 250mm (10”) sewer pipe (as the “SDR” indicates). It is also noted that it is a 45° elbow with each end being gasketed (“G-G”). If it had one gasket end and one spigot end it would read “SP-G.” The list that follows will show our most common types of fittings and any variations that need to be noted.

All of the fittings below are available for both c900, SDR, and some for ultra-rib/Korflo. Important to note that C900 is not available in the wye type fittings.

An Assortment of SDR fittings are show below. Note that all fittings contain a stamp that indicates the size, style, and manufacturer of the fitting. **Be sure to pay careful attention to 11.25 degree, 22.5 degree and 45 degree elbows** as they are commonly mixed up, and can easily cause an individual to miss identify the fitting they are supplying their customer.



- **Tee (Page 31):** Tee fittings look like longer couplings with a gasketed opening coming out of the middle at a 90° angle, resembling the letter “T” (surprise, surprise). These can connect pipe of the same size or connect different size pipes.
- **Wye (Page 32):** These are similar to Tee’s only the pipe leading off of the fitting will be angled and look like a lower case “y” (again... big surprise).
- **Elbow (Page 33):** These are similar to couplings but they direct the pipe on an angle. The most common bends for elbows are 11.25°, 22.5°, 45°, and 90°.
- **Sweep (Page 34):** these are similar to elbows but differ in that they create a bend in the pipe in a smooth rounded bend rather than an angled bend.
- **Increaser (Page 35):** These go under several different names (reducer, bushing, adapter) they connect two pieces of pipe together like a coupling but allow someone to connect two different sizes.
- **Plug (Page 36):** These go into the gasket (bell) end of a pipe to plug the end of it.
- **Cap (Page 36):** Similar to a plug, however they fit over top of the end of pipe instead of going inside.
- **Cross:** These are similar to Tees only they have four ends which form an “X” shape. They can also connect two different size pipe or the same size.
- **Coupling (Page 37):** These are a straight fitting which join two pieces of pipe together. They come either with or without stop (represented as “w/stp” or “l/stp”). A stop is a plastic ledge which is in the middle of the inside of a coupling which stops someone from pushing a piece of pipe too far into the coupling.
- **Saddles / Inserta-tees (Page 43):** These are used to tap storm and sanitary gravity fed lines. Either by inserting into the pipe, or by strapping a saddle tee to the outside of the pipe

***Note:** Some Ultra-Rib Wye’s will end with “B-B-G” rather than “B-B-B” This means that the pipe coming off the wye is SDR sewer pipe rather than Ultra-Rib.

Tees:

-Tees are available for all types of pipe (C900, SDR, and Ultra-Rib). Cast iron (CI) tees are also stocked.

-Tees can be the same size at all three gasket connections, or have a smaller size for the branch out the side of the main pipe.

PVC SDR Tee (Storm/Sewer)



PVC C900 Tee (potable water)



Wyes:

-Wyes can have a smaller connection on the branch off the main pipe connection.

-Wyes are available for both SDR and Ultra-Rib (or a combination). They are not available for C900 due to pressure limitations.

IPEX 150mm SDR Wye G-G-G:



Ultra-Rib Wye:

Note how the ends bell outwards slightly. This is an indication that a fitting is Ultra-Rib rather than SDR. Also note that the branch off the wye is SDR by the look of the bell style



Ultra-Rib Wye connecting to SDR: Note the difference between the ultra-rib ends and the SDR end on the branch.

Elbows / Sweeps:

-Elbows are available for all types of pipe (C900, SDR, and Ultra-Rib/Korflo). Cast iron (CI) elbows are also stocked. SDR and Ultra-Rib come in 90°, 45°, and 22.5° angles. C900 comes in 90°, 45°, 22.5°, and 11.25° angles. Sweeps also come in 5° and 11° angles.

PVC C900 90° Elbow (**G-G**)



PVC SDR 11° sweep (**SP-G**)



Increasers (Reducers):

-Commonly called “increaser”, “reducer”, or “bushings”. They are available for Ultra-Rib, SDR, a combination of Ultra-Rib to SDR, or C900. Cast iron (CI) increasers are also available.

-PVC increasers as a rule cannot reduce to half or smaller of the larger diameter. Example: 12” C900 cannot be reduced down to 6” or smaller diameter C900. For a greater increase / reduction, multiple increasers/reducers can be used in-line. Cast iron (CI) / Ductile Iron (DI) increasers can also accommodate larger reductions than PVC.

PVC C900 Increaser (also known as a reducer or sometimes requested as a bushing)



Plugs / Caps:

-Plugs and caps perform similar tasks. Both are used to seal off, or dead end a pipe. Plugs are inserted into the bell end of the pipe, and caps can be pushed onto the spigot end of the pipe. The advantage of a cap is that it can be placed anywhere the pipe is cut off, plugs can only be used on the bell end of the pipe.

C900 Plug (like in your sink)



PVC SDR Cap (like on a bottle)



Couplings:

-PVC couplings are available in both L/STP and W/STP form. Couplings with a stop have a built in ring that prevents the pipe from moving more than halfway onto the coupling. They are typically used in new construction. Couplings without a stop are often called “repair couplings” or “slip couplings”. They can be slid all the way onto a pipe to reach the break, and are useful for repairs.

- Norwood Waterworks also stocks three mechanical couplings. XR501, Hymax, and the Macro. Each is used in different situations and has different customer preferences, engineering approval, and different sizing availability.



SDR Coupling (L/STP)



SDR Coupling (W/STP)

-Tap couplings are used for C900 applications. It is a PVC C900 coupling with a threaded hole in the side. Tap couplings are used to slide over a water main, and allow for a 2" service to be attached into the coupling to feed a building or house. Tap couplings are not available for SDR, an inserta-tee or saddle tee is used to connect to an existing sewer or storm line.

-C900 Tap coupling – simply remove the plastic cover, and thread in your connection.

C900 Tap Coupling



Repair Couplings:

-There are a wide variety of repair couplings available from our vendors for different OD pipe sizes, and styles. For C900, Norwood stocks 2 of the most popular repair couplings as outlined below, and has 1 other style but not many remaining in stock.

- The XR501 style coupling is being slowly phased out in use by our customers do to the labour intensiveness of tightening 5 or more bolts in the trench. As these couplings get larger in the diameter of pipe they repair, the number of bolts to tighten increase significantly causing more time required for the installation.

XR501 Coupling



-The Hymax / Macro coupling was introduced recently and has grown in popularity due to the 2 bolt connection. It is much easier, and faster to install when the trench is open to the damaged area. Often contractors are limited to the time allowed for road closures, therefore installation time is very important. For more information on the Macro and Hymax coupling, refer to the brochure clip below.

Hymax / Macro Coupling – sometimes called a top bolt



1974



THE ORIGINAL DUCTILE IRON TWO-BOLT COUPLING

In 1974 Romac introduced our first two-bolt coupling, the Ringwej™. The patented Ringwej™ was available in two, four, six and eight inch sizes.

1974 Ringwej™ brochure.



2009



MACRO HP™

ROMAC'S SECOND GENERATION TWO-BOLT EXTENDED RANGE COUPLING

• DESIGNED FOR STRENGTH AND LONG LIFE

- Ductile iron end-rings and center-ring have no welds.
- Heavy duty 5/8" stainless steel bolts with anti-galling protection.
- 304 stainless steel armor.
- Center ring is fusion bonded epoxy in accordance with AWWA C213 & NSF 61 certified.
- End rings are E-coated epoxy.



• EXTENDED RANGE GASKETS

- NEW** With a single one-piece gasket, the Macro™ can accommodate IPS through cast iron pipe. XL sizes cover DI through Oversize Cast Iron.
- NEW** For larger pipe diameters such as some asbestos cement, a separate A/C gasket is included.
- NEW** Stainless steel armor is bonded to the gasket.

• EASY TO HANDLE AND INSTALL

- The built-in handle makes the Macro™ simple to carry and maneuver during installation.
- Stab-fit installation.
- Each end of the Macro™ tightens independently with a single bolt.
- If your work space requires it, the end rings can be clocked.
- The Macro™ is lighter than traditional wide range couplings.

• SEGMENTED END RINGS

- Segmented end rings compress the gaskets evenly around the entire pipe diameter.
- The end ring's integrated hinge allows the Macro™ to be easily disassembled if necessary.

• ALLOWS DEFLECTION

- NEW** The Macro™ can accommodate pipe deflection of up to 10 degrees (5 degrees on each end).

• CATHODIC PROTECTION

- The Macro™ can be ordered with an adapter / connection for cathodic protection if desired.

• ROMAC ORIGINAL DESIGN

- Romac manufactures the Macro™ in the U.S.A.
- Patent Number: 8448993



Blue Brute Fittings

4" - 18" (100mm - 457.2)

N

Blue Brute fittings are injection molded and are even tougher than the pipe. Injection molded Blue Brute fittings have a wall thickness 125% larger than SDR18 pipe, and custom-made fabricated fittings are wrapped with a tough layer of fiberglass for extra protection.

N



Corrosion-Proof Performance

Blue Brute systems are immune to corrosion from aggressive soils and galvanic action.

Superior Hydraulics

The glass-like finish of PVC reduces friction losses and eliminates the tuberculation common in iron pipes. As a result, pumping costs are reduced and water quality is maintained.

Strength

A thicker bell that results in a more robust fitting.

Gaskets Options

All Blue Brute fittings are shipped with standard gaskets that accept cast-iron-sized PVC pipe. Transition gaskets for IPS-sized pipe are an option for all sizes. For applications where fittings must be buried in soil with hydrocarbon contamination, Nitrile gaskets are available.

Saves Time & Money

A consistent O.D. for each size, simplifying the restraint selection. Each fitting is labeled with the O.D. information for easy identification and restraint selection.

Third-party Certification

All IPEX municipal systems are third-party certified as applicable. In addition, IPEX Centurion and Blue Brute systems have Factory Mutual approval and Underwriter's Laboratories (ULI and ULC) listings.

NEW - 10" AND 12" BLUE BRUTE C907 FITTING CONFIGURATIONS

Inserta-Tee and Saddles:

-Saddles are size specific and utilize a gasket and two straps to hold the saddle to the outside of the pipe. After a hole is cored into the existing pipe, the saddle is placed on the outside of the pipe and securely held by the tightening straps. Saddles come in a variety of sizes, and cannot be used on Ultra-rib / Korflo pipe due to the ribs. The pipe must have a smooth outside surface in order to get a seal.



-Inserta Tees can be used in both SDR and Ultra-rib applications. They come in a variety of sizes, and often can cover a range of different sizes of main pipe. Inserta tees are pushed into a cored hole in the main line, and have a rubber seal to prevent leakage. The bell end is a gasket connection to stem pipe off of a main line.

SDR Inserta Tee 4"x8":



Ultra-Rib / Korflo Gaskets:

-All Ultra-Rib / Korflo fittings require gaskets on all ends. Norwood Calgary does not stock Ultra-rib / Korflo gaskets. We order Ultra-rib gaskets as needed, and they also come with each fitting we order. They are available in a variety of sizes from 8” to 42”. Gaskets are not inventory controlled (will not show up on a picker slip as a separate line item) so it is important to remember they are included when pulling an Ultra-Rib fitting.

-Though the barrels should be sorted by size, when in doubt read the edges of the gasket. The size information should be printed on.



Abandon Sleeves:

-Abandon sleeves, or “kill sleeves”, are used when abandoning a service that is tied into a water main.

-Abandon sleeves seal around the water main, and cover over the main stop that is attached to the water main. The service tube is removed, the main stop stays in the water main in the off position. The abandon sleeve then seals around the water main, and the existing main stop to ensure no leakage in the future. It is a safety precaution instead of relying on the main stop which could be damaged during back fill. The abandon sleeve shown below is a 10x3 meaning it is for a 10” water main, and has a 3 inch nib to cover the main stop. This particular abandon sleeve is capable of going over top of a 1.5” main stop or smaller. Norwood can special order abandon sleeves to go over a 2” main stop if required by our customers.



Cathodic Protection:

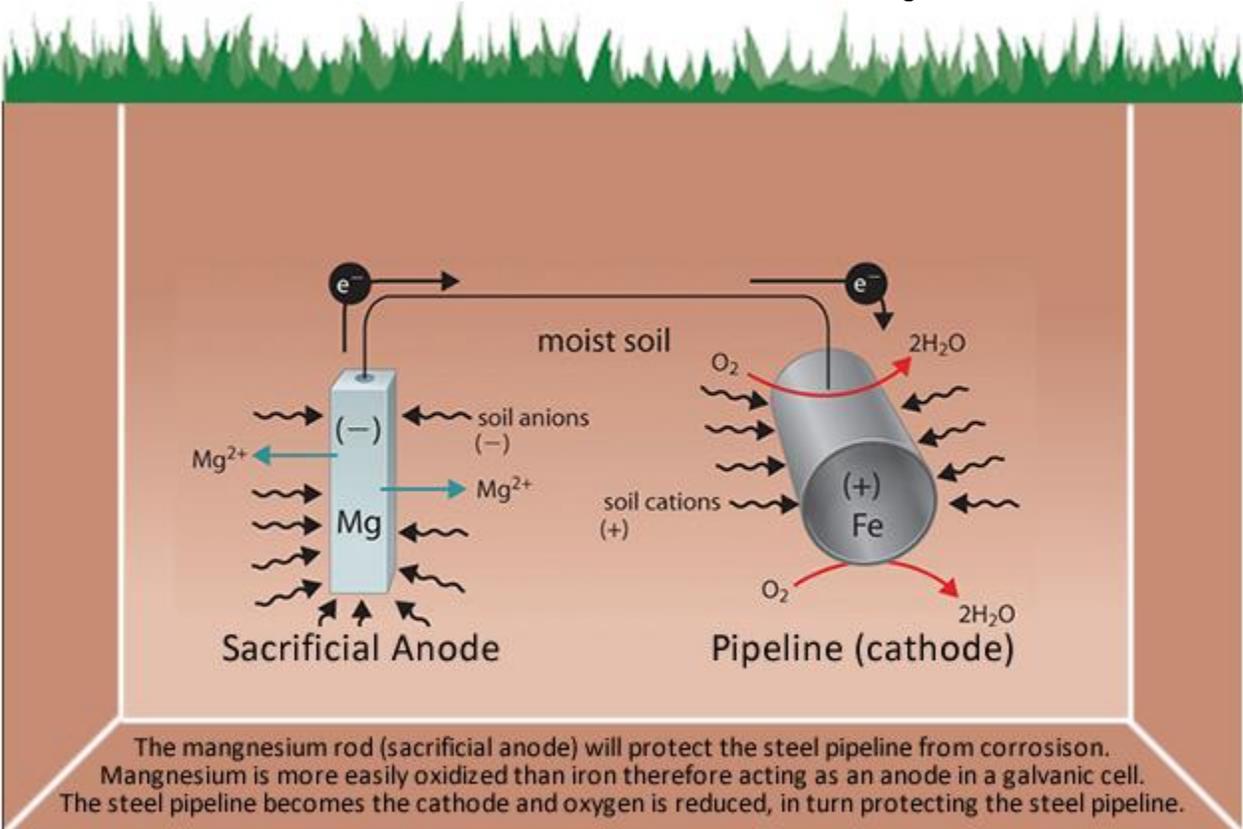
-Cathodic protection helps the longevity of Iron / brass products buried in the ground, and particularly when working in corrosive soils. Cathodic protection is applied to any buried iron products, ex. Valves, DI fittings, hydrants, steel pipe, brass fittings etc.

-There are a variety of methods to achieve cathodic protection, and different specs for different products, and soil types.

-The next several pages will discuss the different cathodic protection products, and the applications for each product.

-Calgary is known to have acidic (hot) soil and therefore anodes are almost always required.

How Cathodic Protection/Anode Works Underground



Anodes:

-Anodes come in a few materials and sizes. Zinc is the most common and 5 and 12 lb. sizes are the typical sizes.

-Norwood also stocks 32lb magnesium anodes for larger pieces of iron, and to meet the specifications of more corrosive soil types such as the soil found in Calgary.

-Anodes have a built in piece of wire that is fastened to the iron, brass, or copper product either by a clamp, or by being Cadwelded (welded) to the metal product to ensure a proper connection with continuity.

-The important thing to remember about anodes is they cannot get wet! Always store them inside in a dry area. Wet anodes release hydrogen gas and present a severe fire hazard. Note: Always wear gloves when handling anodes, and avoid inhalation of the Anode Dust.

-5lb anodes typically used for brass and small fittings in Calgary, 12lb anodes typically used for fire hydrants, and 32lb magnesium anodes are typically used for heavy iron fittings for water mains, and when repairing an iron pipe to protect both the pipe and the repair coupling, depending on the repair coupling used.

5 lb. zinc anode



12 lb. zinc anode



32 lb. magnesium anode



PetroWrap

PetroWrap Primer Paste is a preparatory primer that displaces moisture, pacifies oxides, and fills small irregularities that occur on the surface to be wrapped with PetroWrap® Anti-Corrosion Tape. Norwood stocks it in 2kg & 4kg tubs.



PetroWrap Mastic is a cold applied filler which profiles areas to be tape wrapped by easing contours on pipe joints, flanges, bolts, and other irregular shapes to be wrapped with PetroWrap Anti-Corrosion Tape. Norwood stocks the mastic in 1.8kg blocks



PetroWrap Anti-Corrosion Tape consists of a non-woven, stitch bonded, synthetic fabric which has been fully impregnated with neutral petrolatum based compounds and inert fillers. Norwood stocks 4" & 6" rolls of tape.

Polyken

Polyken is a cold applied tape coating system designed for the corrosion protection of field joints, fittings and specialty piping.

Polyken Primer Paste 1027 liquid adhesive primer is the recommended primer when applying Polyken 900-12 and 930-35 coating tapes. The liquid adhesive consists of butyl based elastomers blended with polymeric resins dissolved in an organic solvent. This provides an instant tack surface when applying the Polyken coatings, while also providing a uniformly smooth application on rough, reconditioned or grit-blasted pipe surfaces. 1027 liquid adhesive primer is available in 16 oz. spray cans or in 1 gallon pails.

The 930 series tape products can be used for both buried and above ground applications, and the product is suitable to resist UV irradiation.

Fittings Exam

1. Name 5 different types of pipe fittings.
2. What does B-B-B stand for?
3. What is the difference between a bend and a sweep?
4. A plug and a cap are interchangeable and used the same way.
5. What is the difference between “with stop” and “less stop” in regards to a coupling.
6. What angles do sweeps come in that elbows do not?
7. How many bolts are on a Hymax/Macro coupling?
8. All Macro couplings are catholically protected.
T or F
9. What does 10x3 mean in regards to an abandon sleeve?
10. What are the 3 sizes of anodes that Norwood sells?

Service Boxes

Service boxes are used to turn curb stops (ball valves) which supply water to individual homes from the main line of water on or off. Norwood Waterworks carries two sizes of service boxes depending on the size of the ball valve, and at several different lengths:

Large boot Service Box:

-As the name suggests, these service boxes have a larger boot to accommodate 2" ball valves. Large boot service box boots will be stamped CCSB2

-CCSB2's come with a thicker rod than all other service boxes. It is important to ship this type of rod instead of the thinner standard SS rod. The rod is thicker because it is operating a larger ball valve.

Note: Always measure a service box length, **do not assume a length**, or a length written on the service box. If it measures 8', then it is an 8-10' service box.



Small Boot Service Box:

-These service boxes have a galvanized metal shaft the same as the large boot service boxes. Like the CCSB2 boxes, the sliding tops, and bottom boot also have set screws to set the appropriate burry length.

-Small boots have CCSB1 stamped on the boot



Service Box Rods:

Service box rods come in various size lengths. We stock rods that are thinner in diameter for small boot service boxes, and larger in diameter for large boot service boxes. Each rod has an end built on to connect to the ball valve with a cotter pin, and a flat end that the service box key (tool) connects to turn the ball valve.

Note: Always be sure to supply the right length rod, and diameter of the rod thickness when adding to a service box.



Cotter Pins:

All Service boxes require a cotter pin for each service box supplied. 2-inch service boxes (CCSB2) have a slightly larger cotter pin.

-Always check each service box before you ship it out to ensure a cotter pin is attached and included with each service box.

-Keep extra cotter pins in each truck to give to customers if they lose, damage, or require extra cotter pins.



Service Box extensions:

-Often Customers will require service box extensions at the completion of each job to ensure all service box tops are at the appropriate grading level.

-Norwood stocks sizes in 3", 4", 6", 8", 10", and 12" extensions. They are attached to the top section of the service box with a threaded coupling. It is not recommended, however, a customer can attach several service box extensions together with several couplings to achieve the appropriate grading level without digging and replacing the complete service box unit. Galvanized service box extensions are shown in the image below.



Curb Stop Blocks:

Plastic Curb stop blocks are made from recycled PVC pipe and are used to keep the service box in place.

-The curb stop block sits underneath the curb stop valve, and acts as a chair for the bottom boot of the service box to sit on, keeping everything in place.

-Norwood also sells metal curb stop chairs but are **not** a City of Calgary spec.



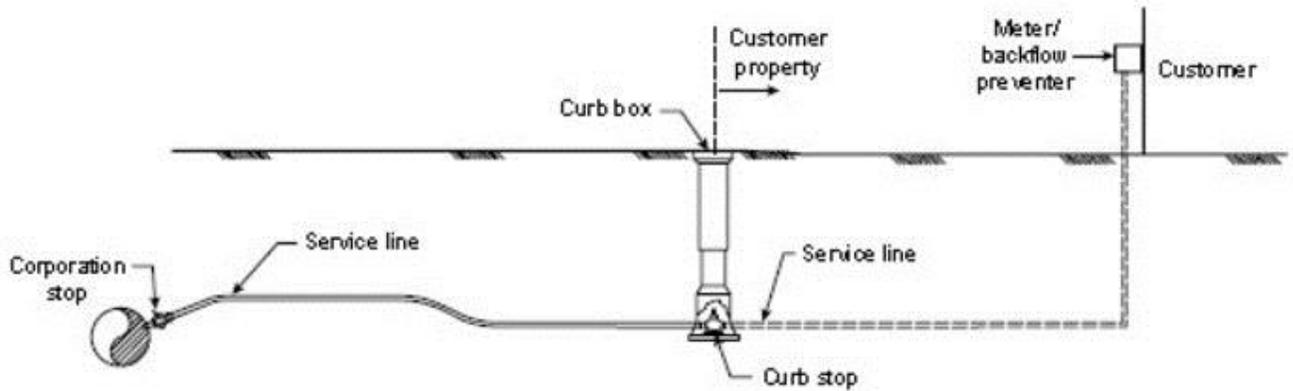
Curb Stop Block



Curb Stop Chair

Example of a typical water service to a residence, and how it flows from the water main to the house.

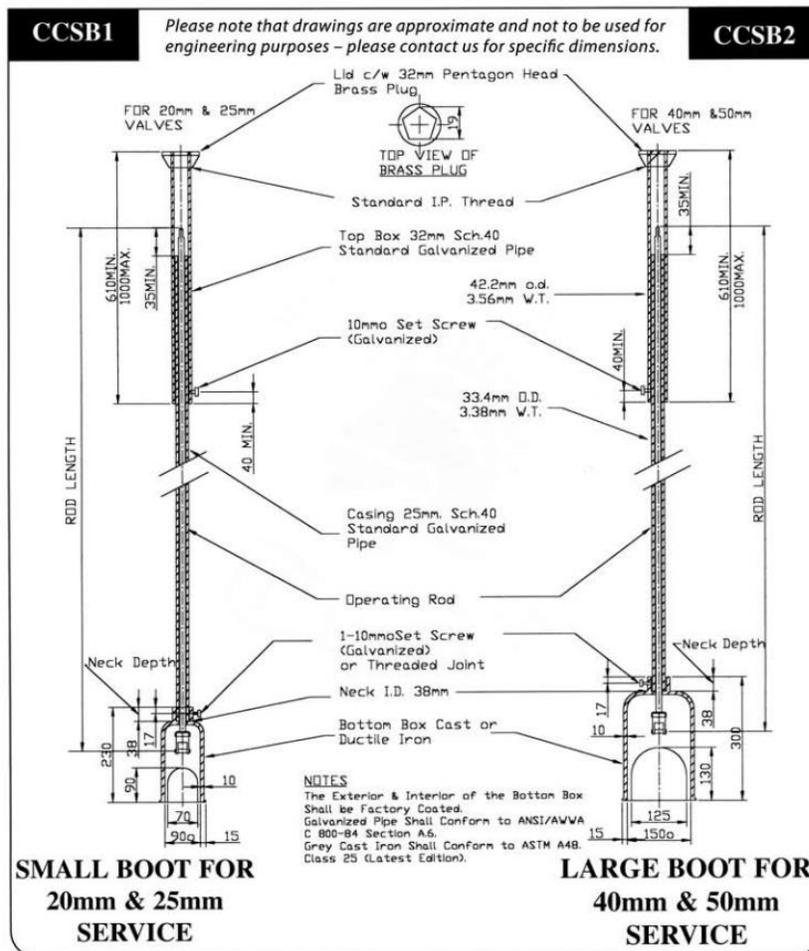
Service Connections



Typical Customer Service Connection



CITY OF CALGARY CORROSION RESISTANT SERVICE BOX



Valve Boxes

Valve boxes are put overtop a gate valve in order to encase a valve box rod, which is used to turn the valve open or closed. There are three types of valve boxes, Type A, Type B, and Type C. Norwood Calgary only stocks Type C valve boxes to meet Calgary city specifications. Norwood Calgary can special order type A or B valve boxes, but are not commonly sold. All valve boxes are the same approximate shape and design, but feature different parts.

Type C Valve Box:

-Type C valve boxes are used in the Calgary region. They are green in colour from an epoxy coating. The top, casing, lid, guide plate and bottom boot, are all sold separately and the contractor assembles to their specification. Type C valve boxes do not use the same rods as type A and B. These rods come with a top nut already bolted on.

The main parts of a Type C valve box are:

1. Valve box top section
2. Valve box casing – stocked in a variety of sizes, and can be cut to the exact length required
3. Valve box bottom boot – large or small
4. Valve box rod with top nut – country rods are square, city rods are round
5. Lid (type C lid)
6. Plastic valve guide plate – small and large valve guide plates for small and large boots

1. Valve box top section:

-Valve box top sections have 2 set screws to connect to the casing at the desired location. They have a female connection at the top for the valve box to hold the valve box lid in place. Norwood Calgary Stocks 24" top sections, with epoxy coating to protect from corrosion.



2. Valve box casing:

-Valve box casings are the middle section of the Type C valve box. They are a straight metal pipe that is epoxy coated, and is stocked in sizes 7', 8', and 9' foot lengths. These casing sections can be cut to any length desired by the customer.

-The Casing has the top section, and bottom boot connected and held in place by set screws. The top and bottom sections can slide up and down on the casing to achieve the desired length required for the valve box. The rod is enclosed in the casing to keep a clear access path to the valve.



3. Valve Box Boots:

-Valve box boots are epoxy coated and are sold in 2 sizes, large and small. Small boots (CVB1) are used for valves from 4" to 8" valves, and large boots (CVB2) are used for valves 10" and larger.

-All valve boots are labeled with either "CVB1" denoting small boot, or "CVB2" denoting large boot. It is important to supply the right valve box boot for specific sized valve.

Large Valve Box boots (CVB2)



Small Valve Box Boots (CVB1)



4. Valve Box Rod:

- Valve Box rods are stocked in country and city specifications, and at a variety of different lengths. Country valve box rods are square rods as illustrated below, and have a larger operating nut mounted to the top of the rod. City valve box rods are round and have a smaller operating nut mounted to the top of the rod.

-Valve box rods come in a variety of lengths, Norwood stocks a large variation of lengths in 6" increments, and can special order any size required by our customers.

-Valve rods are often not sold with valve boxes. Valve Rods are usually purchased at completion of a job, once the contractor has completed all of the grading. This allows the contractor to know the exact size rod required, by measuring the finished length of each valve box.

-All valve box rods have their length written on the operating nut, if you are unsure of the length, always measure the rod to ensure you are providing your customer with the right size rod requested.

Country Valve Box Rods



City Valve Box Rods



5. Valve box lids and plastic guide plates:

- Valve box lids are a standard coated iron lid that is the access hole for the valve box rod.
- The plastic valve guide plates are placed over the operating nut on the valve to help guide the rod into place on the valve operating nut. Small plastic valve guide plates are used for small boots (CVB1), large plastic valve guide plates are used for large sized boots (CVB2). Not all contractors will request valve guide plates, but it is a good question to ask to ensure you are providing a complete service, as they sometimes forget to ask.



Valve Box Extensions:

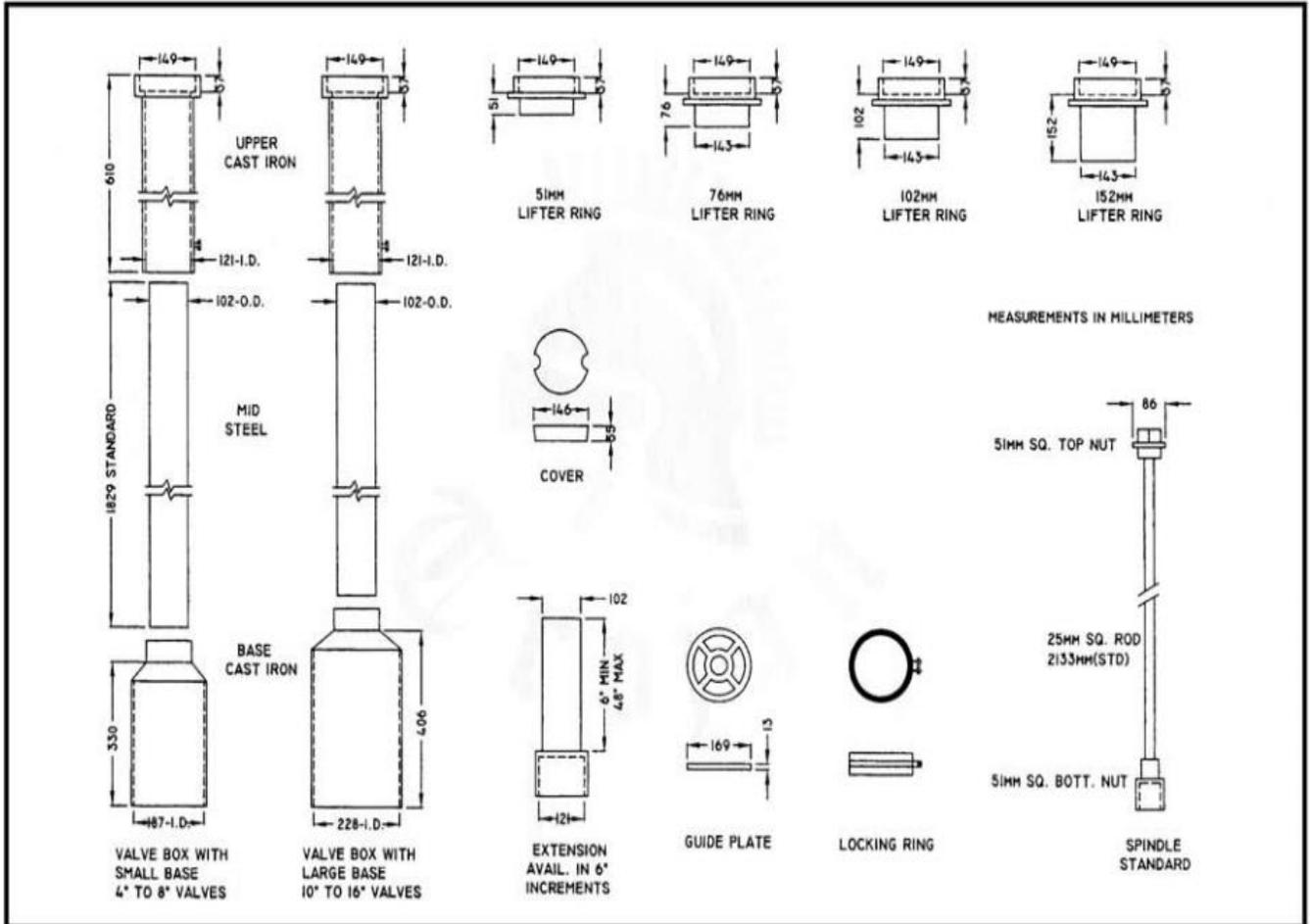
- Norwood stocks a variety of valve box extension sizes from 12" to 48". The size is marked on the outside of the valve box extension, when in doubt, always measure the extension to ensure you are providing the right size for your customer.
- Valve box extensions attach to the top of the casing, and to the bottom of the valve box top section.





Please note that drawings are approximate and not to be used for engineering purposes – please contact us for specific dimensions.

TYPE C VALVE BOX AND COMPONENTS



ISO 9001-2000 CERTIFIED

RATED FOR HS-20 LIVE LOAD

MEASUREMENTS IN MILLIMETERS

TROJAN INDUSTRIES INC.
CALGARY • EDMONTON, ALBERTA

Concrete:

-20KG bags of concrete are stocked for the needs of our customers during installation.

-Contractors will use concrete for a variety of applications when installing underground product, typically for patching around manholes, and patching around holes cored into basements when running new water and sewer services.

-We only have a select few contractors that purchase premixed concrete from Norwood in Calgary.

20 KG Bag



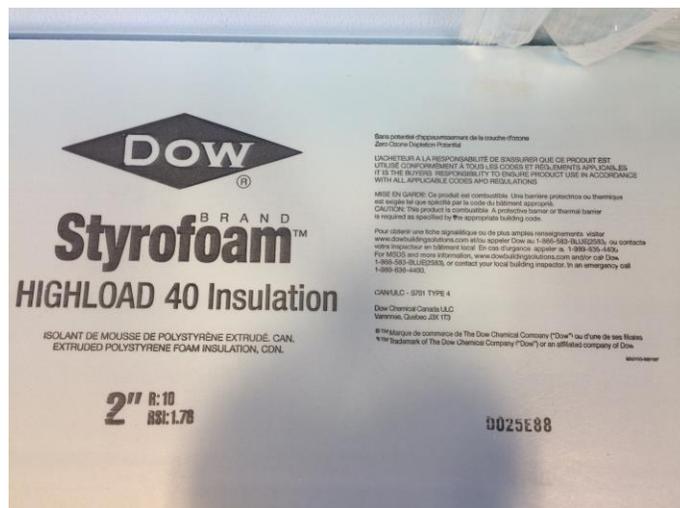
MasterSeal 595 is a cement-based, water-stop mortar. It will stop running and seeping water through cracks in concrete under hydrostatic pressure. It can also be used to provide a watertight seal in pipes, tanks, manholes, and a variety of other locations.



Insulation:

HI40 Insulation is stocked in 2"x2'x8' sheets, and special ordered in 3"x2'x8' sizes.

-HI40 is used for shallow burry water and sewer lines to prevent frost from damaging the pipe. It is much cheaper to supply HI-40 insulation opposed to insulated pipe. Insulated pipe is expensive, has a long lead time, and can be easily damaged. Depending on the burry depth of the pipe, the specifications will range on the thickness of insulation, and the number of sheets required. The Hi-40 acts as an umbrella placed over top of the pipe to shield the pipe from frost, and can extend past the edges of the pipe at larger distances for shallow buried lines. For engineer specifications requiring 4" or greater thickness of insulation, you can supply the customer with multiple 2" thick sheets to achieve the specified thickness required for the job.



Service Box / Valve Box Exam

1. What is the difference between a CCSB1 and a CCSB2?
2. If a service box measures 10' then it is an 8-10' service box.
T or F
3. There are 2 different service box rod thicknesses.
T or F
4. What are the 6 sizes of service box extensions Norwood stocks?
5. What is the main purpose of a curb stop block?
6. Name the 5 main parts of a valve box.
7. What is the difference between a "city" and "country" valve box rod?
8. There is 1 main size of guide plate for valve boxes?
T or F
9. What is the largest valve box extension Norwood stocks?
10. What are the two main sizes HI-40 insulation is stocked in?

Frames & Covers

Manhole Frames & Covers come in many different designs which are used for different applications by contractors. For our purposes, the defining features and important details to be remembered will be covered on our most common manholes. As seen in the example, most manhole frames and covers come either “dipped” or “undipped.” A dipped frame and cover means that it has a painted black coating, while an undipped frame and cover does not have this coating. Most Alberta communities and private property use dipped, however, the **city of Calgary as of 2015 has changed to undipped specifications.**

F39:

-The F39 comes both dipped and undipped, with a grate top or cover. The new style of grate is flat, while the older style has a slightly domed shape. Both are acceptable.

-The F39 is the most common style of frame and grate used outside of the city of Calgary.

F39 Frame Dipped



F39 Frame and cover dipped



F39 Grates undipped



F50 Frames, Grates, and Covers

-F50 frames, grates, and covers are larger in diameter than the F39 manholes. When in doubt, always measure the diameter of the manhole, if the grate or cover measures 22" it's an F39, if it measures 24" it's an F50 grate or cover.

Note: F50 frames are stamped with "49" but it is an F50 frame

-The F50 comes both dipped and undipped, with a grated top or cover.

-Frames can be sold in different heights, shallow, standard, or tall. This allows the contractor to achieve the appropriate height specification to meet their finalized grade of the road.

-F50's are used primarily in the city of Calgary

F50 City of Calgary Cover



-All F50 city of Calgary covers are stamped with an image designed specifically for the city of Calgary, other cities will have their own image stamped on the cover.

K1 Frame and Grates:

-Picker / TREND Description Example: **K1F TYPE K-1 FRAME**



Breakdown: K1F stands for the style of frame. TYPE K-1 FRAME means it is a rectangular frame, meaning the frame that holds the grate. If the picker calls for a K1 grate, simply replace the word "FRAME" with GRATE.

-K1 frame and grates are rectangular in shape, and are used for storm runoff water. You can tell a K1 frame by its shape, and by the markings "T-K1" as shown below.

K1 Catch Basin (frame & grate)



F51 Side Inlet frame and grates:

-Side inlet frame and grates can be sold as one piece and two-piece assemblies. Norwood typically stocks one-piece side inlet frame and grates, but can special order two-piece side inlets as needed. The two-piece side inlet has a removable grate, which is handy because if the grate becomes damaged, it can be replaced separately from the frame. This avoids the entire side inlet frame having to be removed from the curb to replace the grate. Most commonly the grate becomes damaged from snow plows, and the frame remains intact.

F51 Side Inlet (frame &grate)



SK7/DK7:

-K7 catch basins are rectangular in shape and slope downwards. The S and D in the names standard for Single and Double and can be differentiated by either having space for one frame or two frames.

-Norwood Calgary keeps a very low stock of SK7 and DK7 and tends to order as needed for our customers.

SK7 Frame and Grate (single grate)

DK7 Frame (double grate)



Frames & Covers Exam

1. F39 are commonly used within the City of Calgary.

T or F

2. All frames and covers are dipped.

T or F

3. What are the diameters of the F39 and F50 covers?

4. There are 4 sizes of F50 frames.

T or F

5. What does the S & D stand for in regards to SK7/DK7?

Manhole adapters:

-Manhole adapters are sold in a variety of sizes and are used when inserting a storm sewer pipe into a catch basin. The catch basin is made of concrete, and has a hole cored into the side for the storm pipe to enter into the catch basing. The manhole adapter is a rubber seal that holds the storm pipe in the appropriate place, and prevents the sharp edges of the concrete from damaging the pipe.



Link Seal:

Link seal has a similar application as manhole adapters. The difference is that link seal provides a water tight seal around the pipe entering the catch basin. The link seal is wrapped around the outside of the pipe and has bolts that are tightened, which expands the rubber seal around the pipe, and creates a water tight seal between the pipe and catch basin. Link seal comes in a variety of sizes depending on the application, and can be completely customized in diameter by adding or removing a piece of link seal at each bolt connection.

Norwood stocks and sells link seal in the following sizes;
200, 275, 300, 315, 325, 360, 400, 410, 425, 475, 500 & 575



ICD's:

-ICD stands for Inlet Control Device. ICDs are mounted to the inside of the catch basin and are held to the concrete using ICD brackets. The ICD comes rounded, or flat, and with a variety of hole sizes. "R30" denotes the size of the hole in the ICD. Depending on engineer specification, the hole size will vary. The ICD restricts the amount of flow into the catch basin, and is not required for every catch basin installation.



Risers / Spools:

-Risers are made from iron and coated with cement on the inside. A riser is used to bring the water from the underground PVC water line into the Meter Room of a building. When the water line is run under ground, a riser brings it up through the basement of the building, to the appropriate level of the water meter. Often contractors will cut the riser to the appropriate size to meet their specifications.

-Norwood Calgary stocks a variety of sizes from 4" to 10" diameters in either 12' or 15' lengths.

-Risers are sold as a kit with a 4 lug 90 degree ductile iron fitting, gaskets, and threaded rod with hardware. In most cases an OS&Y valve is also supplied.



Ductile Iron Fittings:

-Ductile iron fittings are sold in a variety of different sizes and styles.

-Ductile fittings are used when reducing water lines at large increments, and for water line fittings larger than 10". Recent technology improvements have brought forth PVC fittings that are replacing ductile iron fittings. IPEX now has large diameter C907 fittings, and are starting to be implemented by our contractors. Ductile iron fittings are most commonly used for water lines, and are coated with epoxy to prevent corrosion. All ductile iron fittings require the attachment of an anode to prevent corrosion. Ductile iron fittings require restrainers or concrete thrust blocks to hold them in place. **All ductile iron fittings require gaskets**, the same gaskets that are used for valves.

-Below you will find an assortment of different style ductile iron fittings, and how to appropriately identify the fitting.

Hub by Flange adapter – attached to the spigot of a pipe to allow for a flanged end to bolt on a valve, or other fitting



Reducers: Often called increasers, allow for two different sized pipes to be connected. The “DPR106” indicates that the reducer is used for 10” C900 to 6” C900. This is a two lug fitting, meaning it can be held on using a restrainer with threaded rod by the two lug ears on the outside.



Ductile Iron Cross: used to create a 4 pipe connection. The DI fitting below connects 2 - 12” pipes to 2 - 6” pipes.



DI Tees: DI tees are similar to DI cross, however it connects 1 pipe to the water main line.



DI Bends: DI bends are sold in a variety of different degree variations. The DI bend below “DPB1011” means it is a 10” connection, and an 11 degree bend.



Ductile Iron Plugs: DI plugs are inserted into the C900 pipe at a dead end on the water main, and are restrained by a restrainer or a concrete thrust block. Plugs can only be inserted in the bell end of the pipe.



DI Caps: Ductile iron caps use a gasket and slide over the spigot end of the pipe. Caps are more commonly sold than plugs because the pipe can be cut to any length and have a cap slid over the pipe at any part except for the bell end. This allows for much more versatile fitting compared with using a plug.



DI Bend: The DI bend below “DPB1090” is used for 10” c900 and is a 90 degree bend.



DI Bend: “DPB1245” is used for 12” c900 pipe and is a 45 degree bend.



Ductile Iron Exam

1. Name 5 different types of DI fittings.
2. What **MUST** you include with all ductile fittings that have a “hub” end?
3. Why do some DI fittings have “ears” on them?
4. Name 3 degrees of DI bends.
5. Explain what the highlighted parts of the following TREND description mean.

12x8 DI FLG-TYT **ADPT** CTD

Brass Fittings

-The brass fittings we carry range from ¾ inch to 2 inches. They are normally used for services and are usually couplings, service saddles, curb stops (ball valves), or main stops.

-There are several different connections for the brass fittings, such as compression, MIP (male iron pipe), FIP (female iron pipe), and AWWA.

-Norwood Waterworks supplies both Cambridge Brass and Ford brass fittings. Usage is dependent on customer preference and engineer approval.

-As per city of Calgary spec, all brass fittings are now built without the use of lead.

-A variety of brass fittings can be specially ordered, and some are stocked with unique sizing, connections, and applications.

-It is important to get to know how each type of fitting fits into others as well as how to be creative in constructing set ups to best help customers.

Curb Stop Quick Joint (QJ) (ball valves)



QJ Coupling



Main Stop (QJ by MIP)



QJ 90° Elbow



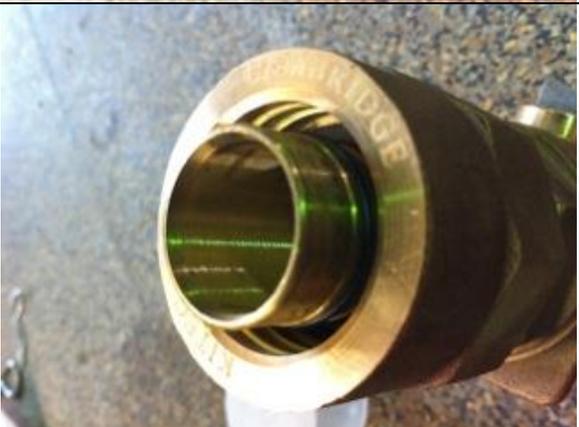
Stainless Steel Inserts:

-Stainless steel inserts are used in the ends of copper tubing / pex tubing that are joining into fittings or services. This prevents the tubing from crushing or misshaping in the connection when using a compression fitting (Quick Joint).

-Inserts come in $\frac{3}{4}$ ", 1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", and 2" sizes to compliment the sizes of tubing

-All quick joint connections connecting to PEX service tubing require stainless steel inserts.



Connection Type	Picture
<p>Compression Commonly referred to as Quick Joint</p>	
<p>Kitec (Commonly used in Edmonton, Not used in the City of Calgary)</p>	
<p>MIP (Male Iron Pipe)</p>	
<p>AWWA</p>	

Cathodic Compression adapter:

-The image below illustrates a quick joint connection with a cathodic adapter. The quick joint connection is removed from the brass fitting and replaced with the quick joint connection below with a cathodic outlet. The set screw with the hole allows for an anode wire to be inserted into the hole and held tightly in place by the screw. This creates a continuity connection between the fitting and the anode used to prevent corrosion when buried under ground.



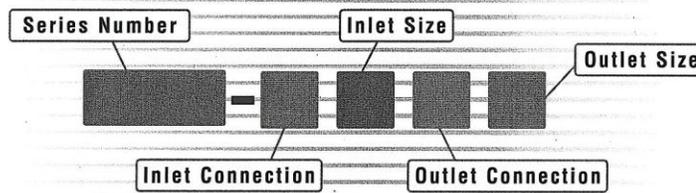
Assorted Brass Fittings:

-Below you will see a brass coupling, brass nipple, brass plug, and a brass plug reducer. These fittings are used to connect multiple fittings, or to downsize a fitting or pipe. Often when a unique fitting is required, you will combine the bellow fittings with several other brass fittings to meet the customers' requirements. Over time, you will become an expert in creating unique fittings from the brass parts we stock.



THIS TEMPLATE PROVIDES INFORMATION ON HOW THE CAMBRIDGE BRASS PRODUCT NUMBERS ARE CREATED. PLEASE CONTACT YOUR REPRESENTATIVE OR CALL US AT 800-265-6638 (CANADA) OR 800-724-3906 (USA) FOR MORE INFORMATION.

NOTE: NO LEAD IS NOT AVAILABLE FOR ALL SERIES NUMBERS. PLEASE CONTACT CAMBRIDGE BRASS FOR MORE INFORMATION.



SERVICE LINE FITTINGS

EXAMPLE: 119-H4H4 = 1" CB x CB FULL BORE COUPLING

Series Number	Inlet Connection	Inlet Size	Outlet Connection	Outlet Size
105	H CB Compression	1 1/2"	H CB Compression	1 1/2"
111	B Campak	2 5/8"	B Campak	2 5/8"
117	J Haystite	3 3/4"	J Haystite	3 3/4"
118	C Copper Flare	4 1"	C Copper Flare	4 1"
119	K Kitec Compression	5 1 1/4"	K Kitec Compression	5 1 1/4"
120	F Female Iron Pipe	6 1 1/2"	F Female Iron Pipe	6 1 1/2"
150	M Male Iron Pipe	7 2"	M Male Iron Pipe	7 2"
151	G CJ Compression		G CJ Compression	
152	Z PEP Compression		O Female Compression Thread	
171	PV PVC Compression		P Female Copper Flare Thread	
			Z PEP Compression	
172			PV PVC Compression	

NOTE: NO LEAD IS NOT AVAILABLE FOR ALL SERIES NUMBERS. PLEASE CONTACT CAMBRIDGE BRASS FOR MORE INFORMATION.



METER ACCESSORIES

EXAMPLE: 417-T6M6 = 2" METER SWIVEL NUT x MIP STRAIGHT METER COUPLING

Series Number	Inlet Connection	Inlet Size	Outlet Connection	Outlet Size	
405	Angle Meter Coupling	F Female Iron Pipe	1 1/2"	M Male Iron Pipe	1 1/2"
406	22 1/2 Degree Meter Coupling	T Meter Swivel Nut	2 3/4"	S Solder	2 3/4"
412	Internal Hex Body Design	N Male Meter Thread	3 3/4"	H CB Compression	3 3/4"
416	Straight Meter Coupling	ME Meter Flange	4 1"	B Campak	4 1"
417	Straight Meter Coupling		6 1 1/2"	J Haystite	6 1 1/2"
421	Brass Meter Flange		7 2"	R Female Meter Thread	7 2"
422	Ductile Iron Meter Flanges			F Female Iron Pipe	
423	Solder Meter Flanges			Z PEP Compression	
440	Meter Increasing Bushing			PV PVC Compression	
				K Kitec	



CURB STOPS/METER VALVES - Ball Style

EXAMPLE: 202-H4H4 = 1" CB x CB BALL CURB STOP

Series Number	Inlet Connection	Inlet Size	Outlet Connection	Outlet Size	
202	Curb Stop	H CB Compression	3 3/4"	H CB Compression	3 3/4"
203	Curb Stop with Drain	B Campak	4 1"	B Campak	4 1"
204	Reduced Port Curb Stop	J Haystite	5 1 1/4"	J Haystite	5 1 1/4"
210	Full Port Angle Meter Valves	C Copper Flare	6 1 1/2"	C Copper Flare	6 1 1/2"
212	Full Port Straight Meter Valves	K Kitec Compression	7 2"	K Kitec Compression	7 2"
214	Reduced Port Angle Meter Valve	F Female Iron Pipe		F Female Iron Pipe	
224	Reduced Port Straight Meter Valve	Z PEP Compression		T Meter Swivel Nut	
234	Double Angle Curb Stop	PV PVC Compression		HE CB Compression Electrical Tail Nut	
252	Open Right			CE Copper Flare Electrical Tail Nut	
253	Open Right with Drain			MF Meter Flange	
262	Minneapolis Pattern			Z PEP Compression	
263	Minneapolis Pattern with Drain			PV PVC Compression	
272	Double Curb Stop				
273	Double Curb Stop with Drain				
274	Reduced Port Double Curb Stop				

360° rotation — add R to end of part number

Handle — add H to end of part number



CURB STOPS - Plug Style

EXAMPLE: 293-H3H3 = 3/4" CB x CB CURB STOP WITH DRAIN

Series Number	Inlet Connection	Inlet Size	Outlet Connection	Outlet Size	
32	Compression Stop and Drain	H CB Compression	1 1/2"	H CB Compression	1 1/2"
282	Double Curb Stop	B Campak	2 3/4"	B Campak	2 3/4"
283	Double Curb Stop with Drain	J Haystite	3 3/4"	J Haystite	3 3/4"
290	Inverted Key	C Copper Flare		C Copper Flare	
293	Inverted Key with Drain	F Female Iron Pipe		F Female Iron	
		Z PEP Compression		HE CB Compression Electrical Tail Nut	
		PV PVC Compression		CE Copper Flare Electrical Tail Nut	
				S Solder	
				Z PEP Compression	
				PV PVC Compression	



MAIN (CORPORATION) STOPS – Ball & Plug Style

EXAMPLE: 302-M4H4 = 1" MALE IRON PIPE x CB COMPRESSION PLUG MAINSTOP

Series Number	Inlet Connection	Inlet Size	Outlet Connection	Outlet Size
301	Ball Style	A AWWA	H CB Compression	1 1/2"
302	Plug Style	M Male Iron Pipe	B Campak	2 3/8"
305	Corporation	P Female Copper Flare Thread	I Insulated	3 3/4"
	Replacement		J Haystite	4 1"
	Adaptor		C Copper Flare	5 1 1/4"
306	Eight Bend		K Kitec Compression	6 1 1/2"
	Swivel Adaptor		F Female Iron Pipe	7 2"
			M Male Iron Pipe	
			HE CB Compression Electrical Tail Nut	
			CE Copper Flare Electrical Tail Nut	
			Z PEP Compression	
			CS Chicago Special Purpose Thread	
			PV PVC Compression	



CHECK VALVES – Dual and Single Style

EXAMPLE: 502-T3F3 = METER SWIVEL NUT X FIP ANGLE DUAL CHECK VALVE

Series Number	Inlet Connection	Inlet Size	Outlet Connection	Outlet Size
500	Angle Dual Check Valve with Test Port	T Meter Swivel Nut	F Female Iron Pipe	3 3/4"
502	Angle Dual Check Valve with Test Port (Horizontal inlet x outlet)			
510	In-Line Dual Check (accessible) with Test Port			
520	In-Line Dual Check (non-accessible)			
590	Angle Single Check Valve with Test Port			



SERVICE SADDLES

EXAMPLE: 810-0750-A7 = DOUBLE STRAP SADDLE FOR 7.50 O.D. PIPE WITH AWWA 2" TAP

Series Number	O.D. Size or top saddle Range	Tap Style	Tap Size
800	Hinge Saddle for C900 Pipe and IPS	A AWWA	3 3/4"
810	Double Strap Brass Saddle	F Female Iron Pipe	4 1"
811	Brass Saddle with Single Stainless Steel Strap Saddle		5 1 1/4"
812	Brass Saddle with Double Stainless Steel Strap Saddle		6 1 1/2"
8402	All Stainless Steel Single bolt		7 2"
8403	All Stainless Steel Double bolt		

Service Saddle:

-Saddles are used to strap around a piece of pipe to hold a main stop valve connecting to the pipe in place and provide a strong hold. They come in a variety of sizes to wrap around pipe, and to accommodate main stops from $\frac{3}{4}$ " to 2".

-There are two types of threading for the main stop. CC and IP. Both will look very similar, but it is important to ship the right type. This should be labeled by the manufacture. A quick way to confirm if a saddle is CC or IP is to run your finger perpendicular over the surface of the hole. If the edges feel smooth, the threading is CC. If the edges are rough, it is IP.

The image below shows a single strap saddle lined with rubber, and a dual strap stainless steel saddle. Both are CC thread, one is $\frac{3}{4}$ " and the other has a 1" outlet for the main stop. The dual strap saddle on the right is the most commonly sold saddle in Calgary, likely because it is less expensive, but both achieve the same application.



Brass Exam

1. What size range does Norwood stock in brass fittings?
2. Quick joint connections are often referred to as what other name?
3. What does MIP stand for?
4. What is the main application for steel inserts?
5. Explain what highlighted portion of the following TREND description means.

10x2CC 2706 DS SDL 980

Hydrants

There are several different manufacturers of hydrants with completely different specifications. It is important to know which type of hydrant the job is asking for. **CV** will be a Canada Valve hydrant and **M67** (also known as a brigadier hydrant) will be a Clow (otherwise known as a McAvity) hydrant.

-Norwood Calgary only stocks the Clow M67 McAvity hydrants.

-There are also two main types of pumper nozzle connections on hydrants, Standard and Storz.

-Different cities will have different specifications for the nozzle style/size

-Hydrants come in a variety of burial depths from 8' to 12'.

-There are also OL (open left) and OR (open right) hydrants. This is in reference to the direction the top nut turns to open the hydrant. The majority of Alberta use OL.

-Hydrants can also come with tyton or flanged bottom connectors. Norwood Calgary only stocks Tyton connecting hydrants

-All specs and styles of hydrants differ by municipality, so it is important to check the style with spec books or the appropriate public works office.

M67 hydrant produced by CLOW, has burry depth labeled on the hydrant, but when in doubt, always measure your hydrant to make sure you supply your customer with the right sized hydrant they request.



Hydrant Extensions:

-Hydrant extensions are used to bring a new hydrant up to required grade, or to adapt to changes in grade for existing hydrants. They are bolted together with flanges to the existing hydrant (flanges and bolts are included). They are sold in 6" to 48" extension sizes.

-All Hydrant extensions come complete with a gasket and extra bolts for the installation. Always make sure this hardware is with the extension when selling/shipping to a customer.



Concrete Hydrant Pads:

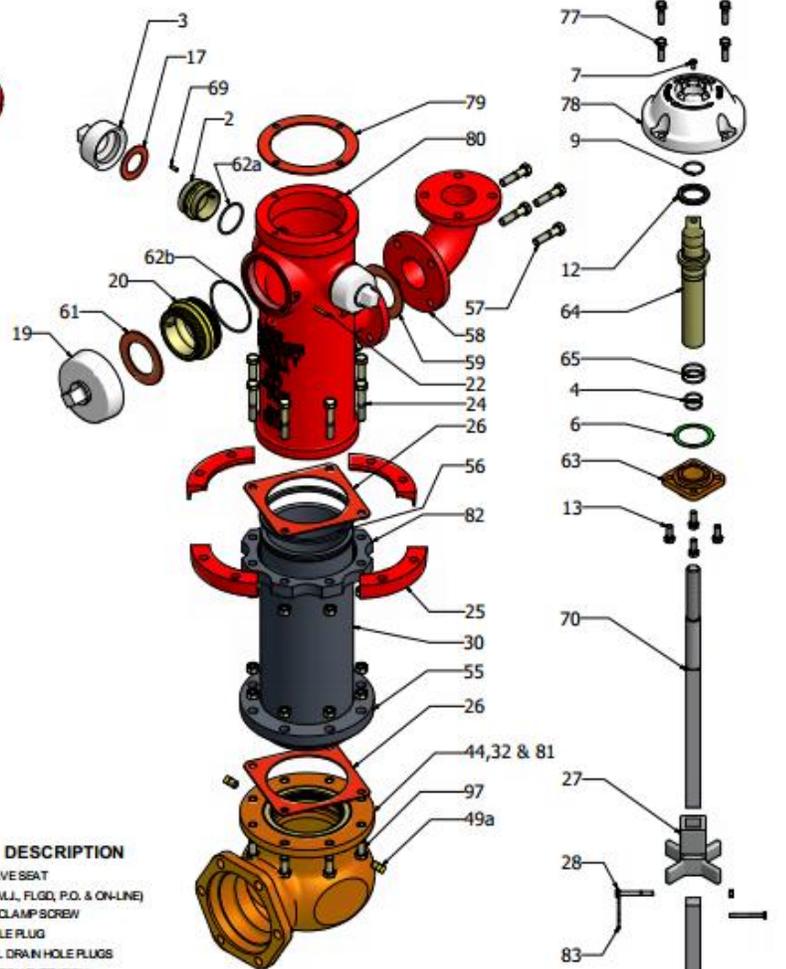
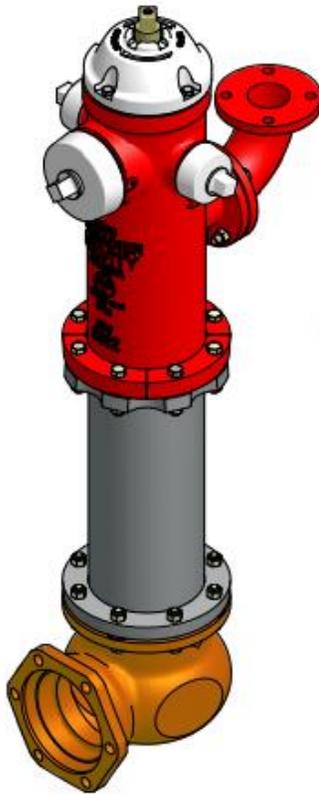
Concrete Hydrant pads are sold when a Hydrant is being installed. The base of the hydrant sits on the concrete pad in the trench. It acts as a support for the hydrant, and stops the hydrant from settling lower, and putting strain on the water pipe. All hydrants installed are accompanied by a shut off valve in the event that the hydrant fails. The master shut off valve is crucial in order to repair or replace the hydrant.



Hydrant Parts:

-A full hydrant is made from many parts. Norwood Waterworks stocks a large number of these parts to use in repairs and alterations by customers. For details on these parts, refer to the following Clow pages. All parts can be found in section G of the warehouse. Every Norwood teammate should have access to a Clow diagram of all parts that make up a Hydrant. If you do not have access to a hydrant diagram, please ask a teammate to get you one from upstairs. The numbers that identify the hydrant parts in the parts key can be used in the trend look up for the part. Often the contractor will have pictures, or have a good idea of the parts they need.



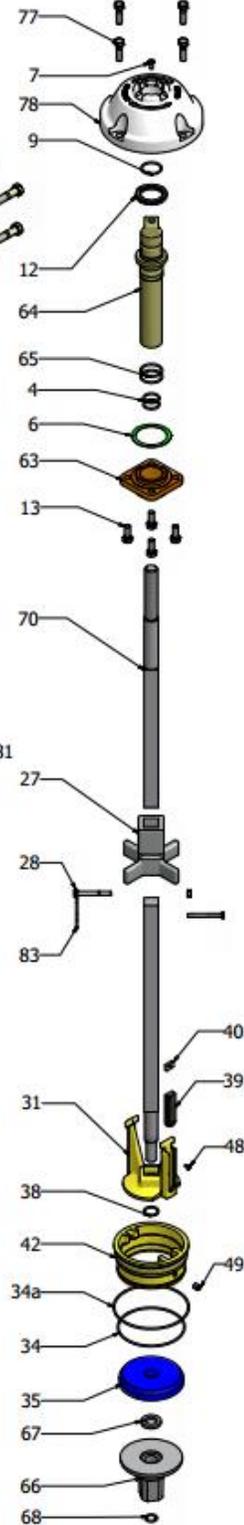


DESCRIPTION

- 2 HOSE NOZZLE
- 3 HOSE NOZZLE CAP
- 4 HOUSING STEM "O" RINGS
- 5 HOSE CAP CHAIN & "S" HOOK
- 6 HOUSING JOINT GASKET
- 7 OIL HOLE SCREW
- 9 OPERATING NUT "O" RING
- 12 OPERATING NUT BEARING
- 13 CAP SCREW 1/2" x 1 1/4"(RET. GLD. BOLTS)
- 17 HOSE CAP GASKET
- 19 PUMPER CAP
- 20 PUMPER NOZZLE
- 21 PUMPER CAP CHAIN & S HOOK
- 22 PUMPER NOZZLE PIN
- 24 INTERSECTION BOLTS & NUTS
- 25 SAFETY FLANGE SEGMENTS
- 26 INTERSECTION GASKET
- 27 SAFETY COUPLING
- 28 SAFETY COUPLING BOLT & NUT (3/8"x3")
- 29 LOWER OPERATING STEM
- 30 INTERMEDIATE SECTION
- 31 DRIP VALVE
- 32" DRAIN HOLE LINING
- 34a MAIN VALVE SEAT "O" RING (UPPER)
- 34 MAIN VALVE SEAT "O" RING (LOWER)
- 35 MAIN VALVE DISC
- 38 MAIN VALVE "O" RING
- 39 DRIP VALVE RUBBER
- 40 HOLDING CLAMP

DESCRIPTION

- 42 MAIN VALVE SEAT
- 44" ELBOW (M.J., FLGD, P.O. & ON-LINE)
- 48 HOLDING CLAMP SCREW
- 49 DRAIN HOLE PLUG
- 49a EXTERNAL DRAIN HOLE PLUGS
- 50 INTERSECTION EXTENSION
- 55 PIPE FLANGE (BOTTOM)
- 56 RETAINING RING (SQUARE)
- 57 MONITOR BOLTS & NUTS (5/8"x2 3/4")
- 58 MONITOR ELBOW
- 59 MONITOR GASKET
- 61 PUMPER CAP GASKET
- 62a HOSE NOZZLE "O" RING
- 62b PUMPER NOZZLE "O" RING
- 63 OPERATING NUT RETAINING GLAND
- 64 HYDRALUBE OPERATING NUT
- 65 RETAINING GLAND "O" RINGS
- 66 LOWER VALVE PLATE
- 67 MAIN VALVE LOCKWASHER
- 68 LOWER VALVE PLATE "O" RING
- 69 HOSE NOZZLE SET SCREW
- 70 UPPER OPERATING STEM
- 77 BODY CAP ALLEN SCREWS OR HEX BOLTS
- 78 BODY CAP
- 79 BODY CAP GASKET
- 80 BODY
- 81" SEAT RING
- 82 PIPE FLANGE (TOP)
- 83 SAFETY COUPLING CLEVIS BOLT & PIN

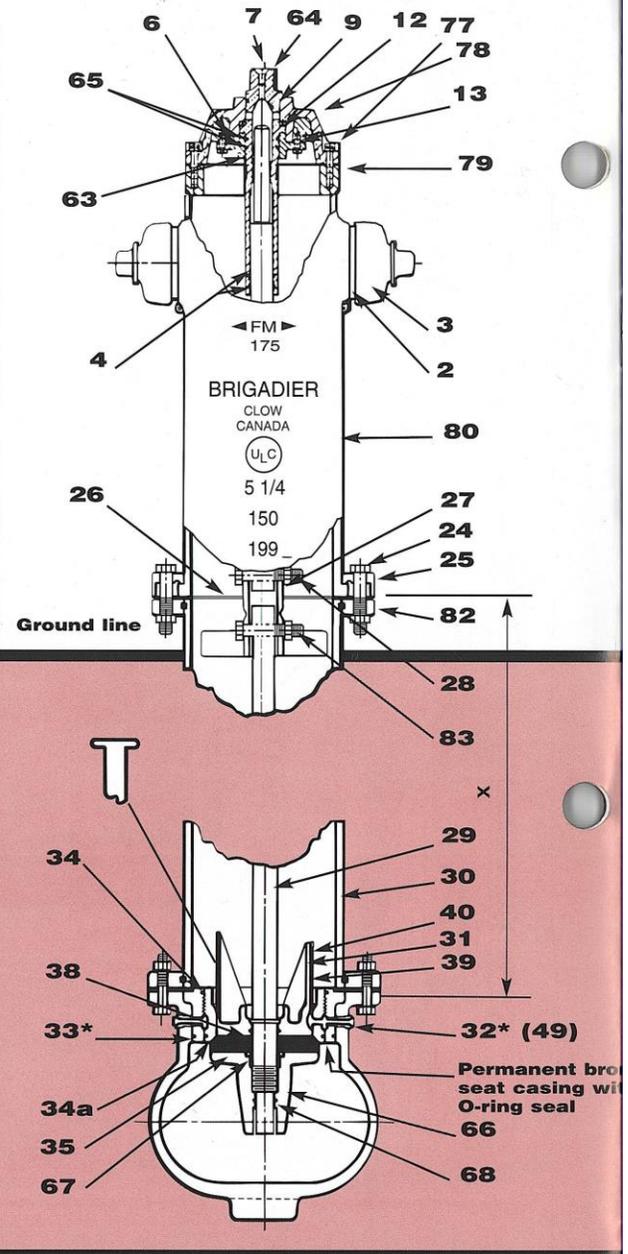


MADE IN CANADA



www.clowcanada.com

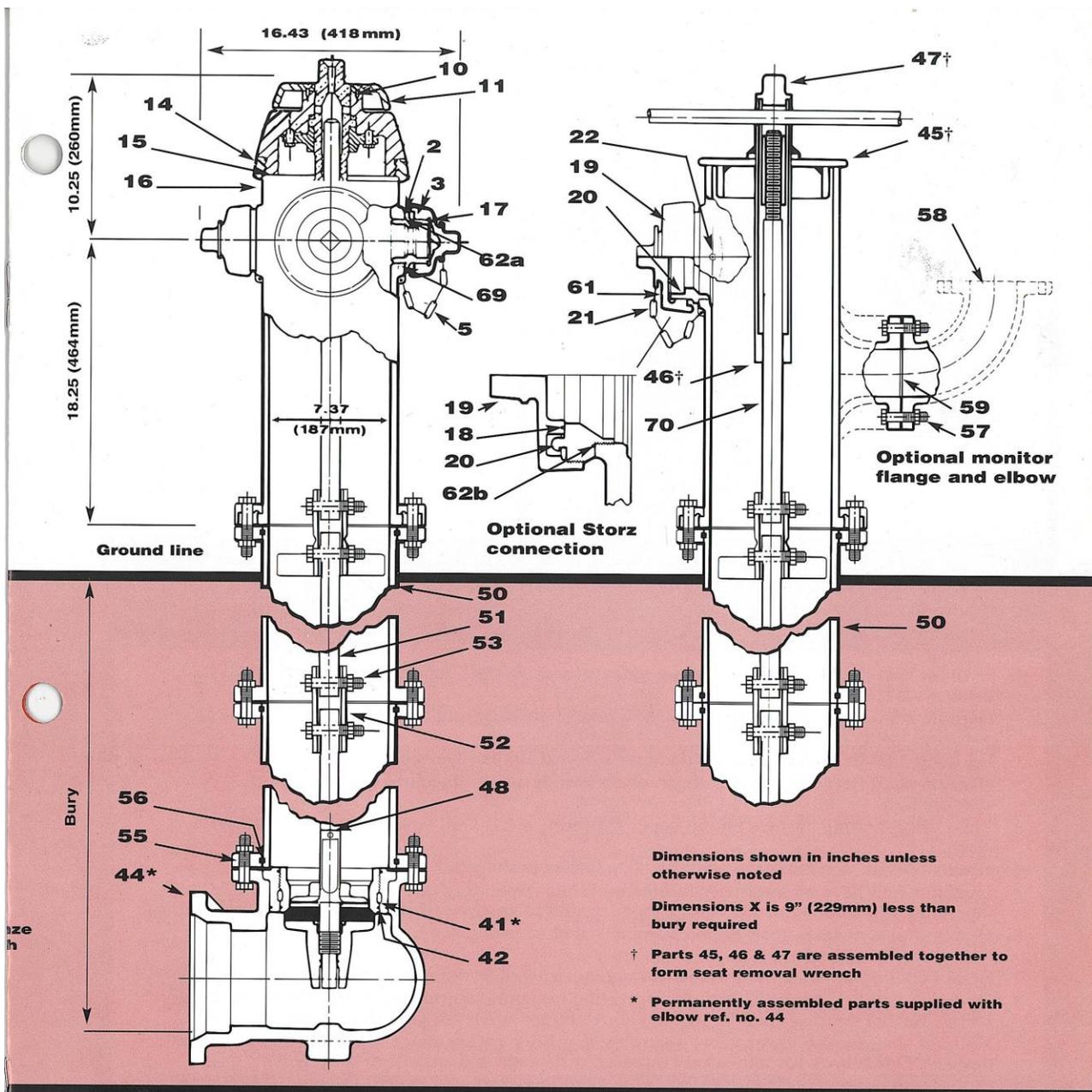
NO.	DESCRIPTION	MATERIAL
2	HOSE NOZZLE	COPPER ALLOY
3	HOSE NOZZLE CAP	CAST IRON
4	HOUSING STEM "O" RING	BUNA N
5	HOSE CAP CHAIN & "S" HOOK	STEEL ZINC PLATED
6	HOUSING JOINT GASKET	COMPRESSED NON ASBESTOS
7	OIL HOLE SCREW	BRASS
9	OPERATING NUT "O" RING	BUNA N
12	OPERATING NUT BEARING	DELTRIN
13	CAP SCREW (RETAINING GLAND)	STEEL Z.P.
17	HOSE CAP GASKET	RED RUBBER
18	PUMPER CAP "O" RING STORZ 100	BUNA N
19	PUMPER NOZZLE CAP	CAST IRON
20	PUMPER NOZZLE	COPPER ALLOY
21	PUMPER CAP CHAIN & "S" HOOK	STEEL Z.P.
24	INTERSECTION BOLTS & NUTS	STEEL Z.P.
25	SAFETY FLANGE (SEGMENTS)	CAST IRON
26	INTERSECTION GASKET	RED RUBBER
27	SAFETY COUPLING	CAST IRON
28	SAFETY COUPLING BOLT & NUT	STEEL Z.P.
29	OPERATING STEM LOWER	STEEL
30	INTERMEDIATE SECTION	DUCTILE
31	DRIP VALVE	COPPER ALLOY
*32	DRAIN HOLE LINING	BRASS
34	SEAT "O" RING TOP	BUNA N
34 A	SEAT "O" RING BOTTOM	BUNA N
35	MAIN VALVE DISC	RUBBER
38	MAIN VALVE "O" RING	BUNA N
39	DRIP VALVE FACING	RUBBER
40	HOLDING CLAMP	PLASTIC
42	MAIN VALVE SEAT	COPPER ALLOY
*44	ELBOW (STATE INLET REQUIRED)	CAST IRON
**45†	GUIDE PLATE ASSEMBLY	STEEL
**46†	INTERIOR WRENCH	STEEL
47†	HOLDING NUT	COPPER ALLOY
48	HOLDING CLAMP SCREW	BRASS
49	DRAIN HOLE PLUG	BRASS
50	INTERSECTION EXTENSION	DUCTILE IRON
51	INTER-EXTENSION STEM	STEEL
52	ALIGNMENT COUPLING	CAST IRON
53	EXTENSION STEM BOLT & NUT	STEEL Z.P.
55	PIPE FLANGE (BOTTOM)	CAST IRON
56	RETAINING RING (SQUARE)	STEEL Z.P.
57	MONITOR BOLT & NUT	STEEL Z.P.
58	MONITOR ELBOW	CAST IRON
59	MONITOR GASKET	RED RUBBER
61	PUMPER CAP GASKET	RED RUBBER
62 A	HOSE NOZZLE "O" RING	BUNA N
62 B	PUMPER NOZZLE "O" RING	BUNA N
63	OPERATING NUT RETAINING GLAND	CAST IRON
64	OPERATING NUT	COPPER ALLOY
65	OPERATING NUT "O" RING	BUNA N
66	LOWER VALVE PLATE	CAST IRON
67	LOCKWASHER	STAINLESS STEEL
68	LOWER VALVE PLATE "O" RING	BUNA N
69	H. NOZ. SET SCREW, PUMP. NOZ. PIN	ST. STL., BRASS
70	OPERATING STEM UPPER	STAINLESS STEEL
71	STORZ 100 PUMPER NOZZLE	STAINLESS STEEL
72	STORZ 65 HOSE NOZZLE	COPPER ALLOY
73	STORZ 65 HOSE CAP "O" RING	BUNA N
74	STORZ 65 HOSE CAP	CAST IRON
75	STORZ 100 PUMPER NOZZLE	COPPER ALLOY
76	STORZ 100 PUMPER CAP	CAST IRON



NO.	DESCRIPTION	MATERIAL
77	BODY CAP BOLTS	STAINLESS STEEL
78	BODY CAP	CAST IRON
79	BODY CAP GASKET	RED RUBBER
80	BODY	CAST IRON
*81	SEAT RING	COPPER ALLOY
82	PIPE FLANGE (TOP)	CAST IRON
83	SAFETY COUPLING CLEVIS BOLT & PIN	STEEL Z.P.

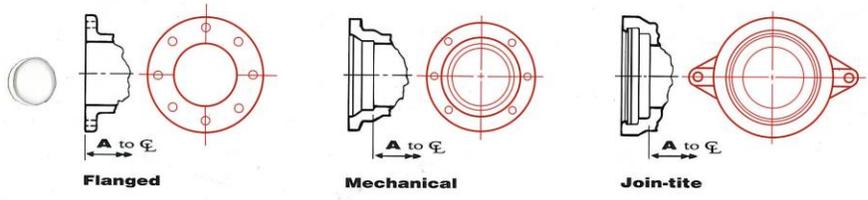
PARTS LIST

• BOLT DOWN: 77/78/79/80
† SCREW DOWN: 10/14/15/16



BRIGADIER M DESIGN DETAILS

Hydrant end joints



	4"	6"	8"
Flanged	8.25"	8.75"	
Mechanical	5.50"	6.00"	7.50"
Join-tite		4.62"	

DIMENSION A

Hydrant Exam

1. A M67 hydrant is also known by what name?
2. Norwood only stock hydrants from one manufacturer.
T or F
3. What are the 2 types of pumper nozzle connections?
4. What is the range of burial depths that Norwood stocks?
5. All municipalities within Alberta require the same specs on hydrants.

T or F

Gate Valves

-Our most common gate valves range from 4" – 12". They will either have a Tyton (also known as "push on") or Flanged connection. Flanged connections will have a flat surface with holes all around the edge of the opening for bolts to connect through. Gate valves can also have a tyton by flange connection, or a tyton by flange tapping valve connection. The tapping valve connection has a machined surface for the tapping machine to bolt securely to when performing a hot tap. Tyton connections will have a gasketed opening with two bolt holes on either side of the opening to restrain the valve.

-For tyton gate valves, it is important to ship an appropriate-sized gasket for each tyton connection.

-Norwood Calgary Stocks 4"-12" valves in both Open Right (City of Calgary Spec) and Open Left for outside of Calgary usage. Norwood also stocks tyton by tyton, flange by flange, and hub by flange / tapping valves

-Norwood only stocks Clow valves, epoxy coated to spec, with a thicker epoxy coating for city of Calgary installation.

Open Left (Black Nut – Outside City Calgary)



Open Right (Red Nut – City Calgary)



Hub x Hub:

Tyton by Tyton – commonly referred to as push on, requires two tyton gaskets. Most often a valve box is sold with a valve, unless the customer already has a valve box.

Tyton Gate Valve



Flange by Flange gate valve:

-All internals are identical to a tyton by tyton gate valve, the only difference is the flanged connections. Below you will see and open left (OL) and open right (OR) valve.

Flanged Gate valve OL and OR



Tapping Valves:

-Tapping valves differ slightly from standard gate valves. They will have one tyton side and one flanged end. They are sold with both the tyton gasket, as well as a flanged gasket and bolt pack.

-The flanged side of a tapping valve has been machined (no epoxy coating). It is important to keep tapping valves dry to prevent this exposed side from rusting. It is also important to notice the machined side when looking for a tapping valve. Flanged by tyton standard gate valves do exist, so it is important to distinguish the difference. On a tapping valve you will also notice that the tyton side is also machined smooth.

Video of Hot Tap:

<https://www.youtube.com/watch?v=CXBHVqOJSNA>

OR tapping valve



CLOW ULFM - AWWA R/W VALVE

Features and Benefits



DELTRIN THRUST BEARINGS ABOVE AND BELOW THE THRUST COLLAR REDUCE FRICTION AND MINIMIZE OPERATING TORQUES.

ELECTRO-PLATED NUTS AND BOLTS PROVIDE LONG-LIFE CORROSION PROTECTION. STAINLESS STEEL BOLTS AND NUTS ARE AVAILABLE WHEN REQUESTED.

LONG, TROUBLE FREE LIFE WITH HIGH STRENGTH, NON-CORROSIVE BRONZE STEM AND STEM NUT.

100% COATED WEDGE ENSURES BUBBLE-TIGHT SEAL EVERY TIME UP TO 250 PSI. WITH TWIN SEAL DESIGN.

SMOOTH, UNOBSTRUCTED WATERWAY IS FREE OF POCKETS, CAVITIES, AND DEPRESSIONS ALLOWING FOR MINIMAL FLOW LOSS AND LOWER PUMPING COSTS. ALL VALVES ACCEPT FULL SIZE TAPPING CUTTER.

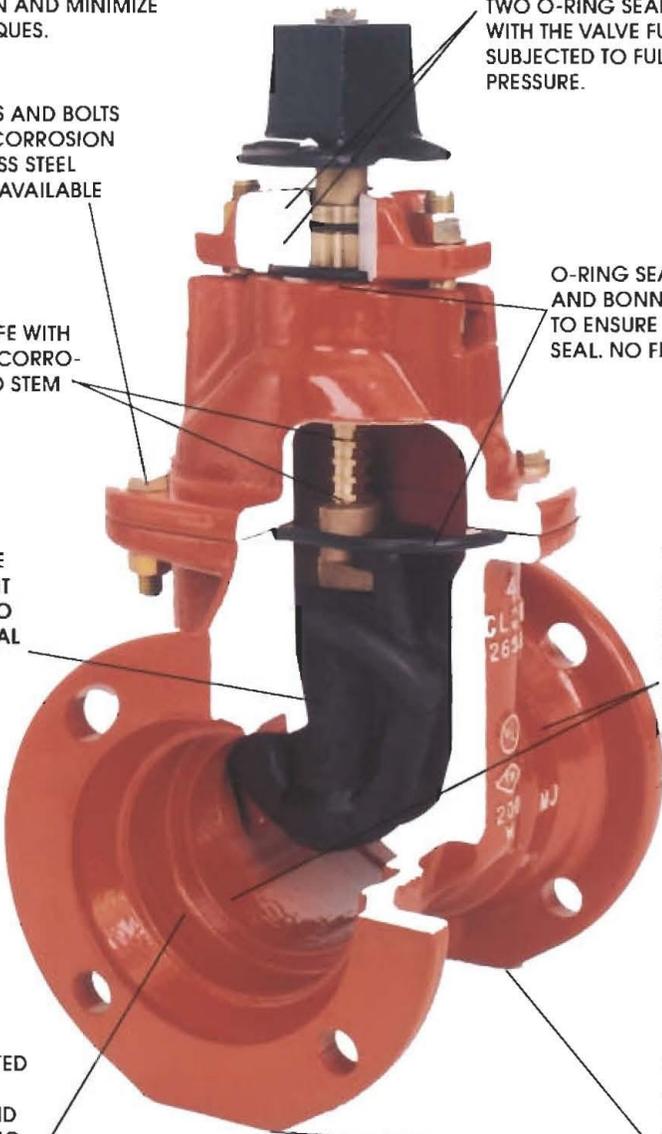
TWO O-RING SEALS ARE REPLACEABLE WITH THE VALVE FULLY OPEN AND SUBJECTED TO FULL-RATED WORKING PRESSURE.

O-RING SEALS AT STUFFING BOX AND BONNET TO BODY FLANGES TO ENSURE THE BEST POSSIBLE SEAL. NO FLAT GASKETS.

CLOW CORROSION RESISTANT FUSION-BONDED EPOXY COATING, CONFORMING TO AWWA C-550 AND NSF61 APPROVED, PROTECTS BOTH INSIDE AND OUTSIDE OF VALVE.

PADS ON THE BOTTOM OF ALL VALVES KEEP VALVE IN UPRIGHT POSITION FOR EASIER STORAGE AND PROTECTION FROM THE ELEMENTS.

ALL VALVES ARE RATED AT 250 PSI FOR AWWA SERVICE AND 200 PSI FOR ULFM SERVICE. ALL VALVES ARE HYDROSTATICALLY TESTED TO 500 PSI.



OS&Y Valves:

-OS&Y valves are used inside a building, and are often called a master control valve. They have a flange by flange connection and are used to connect to the riser, and act as an emergency shutoff at the entrance of the water into the building. OS&Y valves are used throughout the building at various points based on the engineering spec of the buildings water system. All OS&Y valves require bolt packs with gaskets to connect to flange ends, or flange adapters placed on the pipes. Norwood stocks very few different sizes of OS&Y valves, but can order as needed to meet our customer's needs. The Blue valves below are supplied by WATTS, and the red valves are supplied by CLOW. These valves do not require a valve box as they are operated by hand using the wheel as opposed to an operating nut. WATTS are the preferred supplier for OS&Y valves.



Tyton Gaskets:

Tyton gaskets are supplied with all valves (except flange by flange) and all ductile iron fittings. Norwood Calgary stocks sizes from 4-12 inch. If you are unsure of the gasket size, the size is marked on the outside edge of all gaskets.

Always remember to supply gaskets with valves.



Below are tyton Nitrile gaskets – used when engineer spec requires gaskets resistant to corrosive soils and petroleum's. Nitrile gaskets, and Nitrile pipe gaskets are becoming more popular in the city of Calgary.



Valve Exam

1. What are the 3 types of connections that gate valves can have?
2. What must you always make sure to include when selling a gate valve?
3. What is the difference between the red and black top bolt on a gate valve?
4. What makes a tapping gate valve unique?
5. An OS&Y valve is commonly buried underground.

T or F

Uniflange Restrainer

1300 Joint Restrainer:

-Joint Restrainers are used to restrain two pieces of pipe (or fittings) together if they are under pressure.

-Restrainers can be used instead of pouring a concrete thrust block, and are required when installing a tyton by tyton gate valve, and other pressurized fittings.

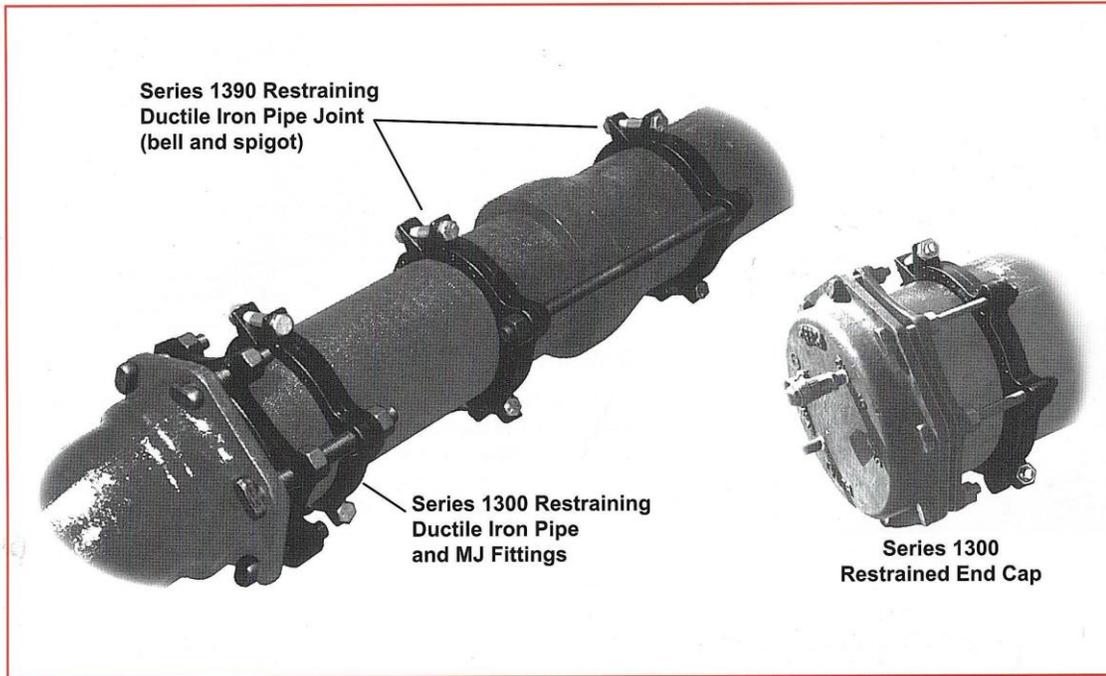


-Norwood stocks a variety of different sized restrainers. 1300 series restrainer are a single 2 piece grip ring with included hardware. A 1360 comes with 1 grip ring, 1 smooth ring and hardware, while 1390s will be 2 grip rings with hardware.

Note: Always make sure the appropriate hardware is included when selling a restrainer.

Uni-Flange® Series 1300, 1390 And Casing Spacers For Use On Ductile Iron Pipe

Both the 1300 and 1390 offer full circumferential contact and support of the pipe wall. This is recommended by many pipe manufacturers and is **especially important when thinner walled pipes are used, such as AWWA C-151, Class 50 or the "Pressure Class" Ductile Iron Pipe.** There are no set screws or wedges that may distort / point load the pipe or damage the cement mortar lining. (In fact, the Series 1300 / 1390 combination is very similar to certain "factory restrained joint pipe" with easier installation, faster availability, and a lower overall cost.)



Pressure Ratings, Ductile Iron Applications

Series 1300-C and 1390-C for Ductile Iron Pipe			
*NOMINAL PIPE SIZE	PIPE STANDARD	TYPE AND SIZE	*PRESSURE RATING (PSI)
4" - 16"	ANSI / A21.51 AWWA C-151	Ductile 4" - 8"	250
		Ductile 10" - 12"	200
		Ductile 14"	150
		Ductile 16"	100

Note: Not recommended for use on machined end pipe or fittings.

* For higher pressure requirements or larger size bell and spigot restraint, see Series 1450. Installation requires maximum torque values stated in installation instructions.

To Order: See 4" - 16" 1300-C, 1390-C and Casing Spacer product listings within this catalog.

Ready Rod:

-Ready Rod is sold in with joint restrainers, and risers. It is sold in 12' lengths, and comes in 5/8", 3/4" and 7/8" thicknesses. It is cut up on site and used to join the two joint restrainers together. Hex nuts and washers are sold along with the rod.

-Norwood also stocks coupling nuts. Coupling nuts are used to join two pieces of ready rod together to extend past 12'



Ready rod washers, coupling nuts and regular nuts are illustrated below. All nuts, couplings, and washers are stainless steel and stocked in 5/8" 3/4" and 7/8" sizes. Note: If unsure of the ready rod or hardware size, always check to ensure your nut threads onto the ready rod. This acts as a double check for the ready rod and hardware picked.



Flange Adapter:

-Flange adapters connect onto the end of a piece of pipe to allow it to connect to a flanged connection (such as flanged hydrant or valve).



Bolt Pack:

-Bolt packs of various styles are sold with many products. The standard Terminal City bolt pack that Norwood stocks is used for flanged connections.

-With any flanged fitting, or flanged valve, we often sell a bolt pack for the customer to use in the connection of the fittings and valves.



Restrainer Exam

1. What are the 3 different types of restrainers?
2. Hardware for restrainers must always be sold with restrainers.
T or F
3. What are the 3 different thicknesses that Norwood sells ready rod in?
4. What does UFA stand for?
5. What is included in a standard bolt pack?

Misc. Warehouse Products

Fernco Coupling:

-Fernco couplings are flexible connections between two different lengths of pipe. They can connect similar pipe together or different types of pipe (sizes or material).

-They can work with metal, plastic, clay pipe and concrete.

56- Means it connects CI/PL-CI/PL CPLG

06- Means it connects CONC-CI/PL CPLG

02- Means it connects CLAY-CI/PL CPLG



Casing Spacers:

-Casing spacers are used to hold a smaller diameter pipe in-center of a larger diameter pipe. Often used when coring under a building, the carrier pipe will be placed inside a larger diameter casing pipe. The casing spacers ensure the carrier pipe is held in the center of the protecting casing pipe, and the distance between casing spacers is denoted by the engineer. Norwood Waterworks does not stock casing spacers, but can order as needed for our customers.



Repair Clamps:

-Repair clamps are used to fix small leaks that may occur in a pipe. They are made of stainless steel metal or epoxy coating and typically have a rubberized interior to provide a gasketed seal.





5606 STAINLESS STEEL REPAIR CLAMP



APPLICATIONS:

ROBAR 5606 Single Section Repair Clamps are used to repair small holes or breaks in water mains. The 5606 has a full wrap gasket.

MATERIAL SPECIFICATIONS:

Shell: T304 Stainless Steel, fully passivated*.
 Sidebar: T304 Stainless Steel, fully passivated*.
 Armor: T304 Stainless Steel, fully passivated*.
 Gasket: SBR (Buna S) Rubber.
 Fasteners: 1/2" NC T304 Stainless steel.
 Nuts coated with anti-galling compound.
 Torque is 45 ft. lbs.

HOW TO ORDER:

Determine the product number (5606), high limit of range (see table below) and length of clamp and then order by using appropriate ordering code as shown in the following example.

For a 12" long clamp on a pipe with an OD of between (6.85" - 7.10"), the ordering code is:

5606 7.10" x 12"
 product high limit of clamp
 number range width
 i.e. 5606 - 7.10 x 12

5606 REPAIR CLAMP CHART

NOMI- NAL PIPE SIZE	WORKING RANGE		APPROXIMATE SHIPPING WEIGHT (LBS.)			
			LENGTH OF CLAMP (Common Sizes)			
	LOW	HIGH	4"	6"	8"	12"
2	2.12	2.37	1.0	1.8	2.0	3.1
	2.25	2.50				
	2.37	2.62				
	2.63	2.88				
	2.87	3.12				
3	3.25	3.50	1.5	2.5	3.0	4.5
	3.50	3.75				
	3.74	3.99				
4	4.45	4.70	1.8	3.0	4.5	5.3
	4.75	5.00				
6	6.58	6.83	2.5	3.8	5.0	7.5
	6.85	7.10				
8	8.58	8.83	2.8	4.5	5.5	8.3
	9.00	9.25				

All dimensions are in inches.

Note: * Refers to chemically treating Stainless Steel after welding ("Pickled/Passivated") to return it to its original appearance.
 - Prices for special designs, lengths or diameters may be obtained from the factory on request.

ROBAR INDUSTRIES LTD.

Surrey, British Columbia
 Phone: 1-800-663-6553

Boucherville, Quebec
 Phone: 1-800-315-9525

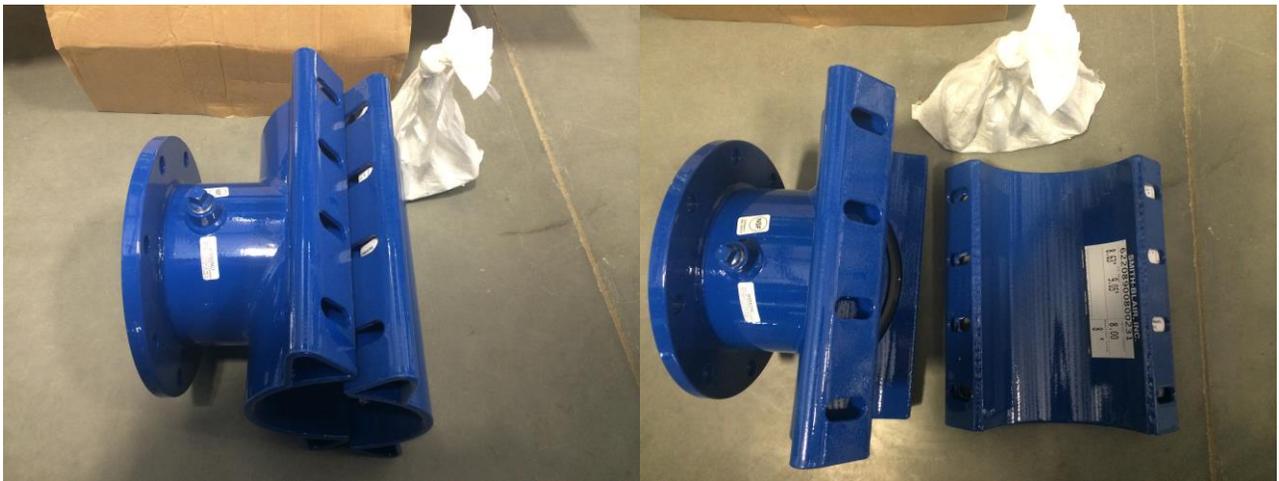
Calhoun, Georgia
 Phone: 1-855-305-6186

Website: www.robarindustries.com / E-mail: waterworks@robarindustries.com

Tapping Sleeves:

-Tapping sleeves are used to do a “hot tap” on a pipe. The sleeve is clamped over an active “mother” pipe or water main, a tapping valve is bolted to the tapping sleeve, and then a tapping machine is used to cut a hole into the pipe and secure a tap by going through the hole in the sleeve. This allows for uninterrupted water service, in comparison to putting on a standard tee fitting. The Valve is in the open position and allows the tapping machine to core the hole, the tapping machine keeps a water tight seal. Once the hole has been cored the tapping machine retracts to allow the tapping valve to be closed. Once the Tapping valve has been closed, the tapping machine can be removed and the pipe can be installed without any water leakage. Once the pipe is in place the valve is opened and the new water pipe is pressurized. We stock a wide variety of tapping sleeves, however, our customers prefer the Smith Blair tapping sleeve.

-An interesting fact, all hot taps require a submittal of the coupon (cored piece of water main) to the City for inspection to ensure the tap was performed without any errors.



Counter Plus



-Norwood Waterworks stocks a variety of valuable tools and small products at our front counter. These are smaller day to day items that customers will often be looking for when they walk in. Some of the materials are below.

-If you have frequent request for a product that is not available at our counters plus section, discuss with your teammates about stocking some small items to better serve our customers.

- Safety vests
- Wiping rags
- Ratchet straps
- Measuring tapes
- Adjustable Hydrant Wrenches
- Hydrant setter w/spreader bars
- Up-Down Paint
- Florescent Ribbon
- Truck Strapping & Bungie Cords
- Quick Dry Cement
- Hand and hole saws
- Electric & Teflon tape
- Universal Valve Lifter
- Chlorine Kits *special order

Misc. Product Exam

1. Explain what the following Fernco connections mean;
 - a) 56
 - b) 06
 - c) 02
2. Casing spacers are used to hold a larger diameter pipe around a smaller pipe.

T or F

3. What does the highlighted portion in the following trend example denote in regards to a repair clamp?

12x12 5626 REP CLAMP 1370-1450

4. A tapping sleeve is a not required when wanting to connect a tapping valve to a tapping machine.

T or F

5. Name 3 common products you will see at the Counter Plus



SUPPLIERS & LINKS	WEBSITE	PRODUCTS
Acklands-Grainger	www.acklandsgrainger.com	Site & Worker Supplies
BBS Industries		Hole Saws
Besco	www.besco.ab.ca	Specialty Valves
Cambridge Brass	www.cambridgebrass.com	Service Brass, Saddles
Canada Pipeline & access.	www.canadapipeline.com	Saddles, Tapping Sleeves Watermain, Couplings
Clow	www.clowcanada.com	Valves, Hydrants
Corrpro	www.corrpro.ca	Anodes & accessories
CSI	www.csicoating.com	Pipe Insulation
Guillevin	www.guillevin.com	Electrical Conduit
Ipex	www.ipexinc.com	Watermain, Sewer, Ultra Rib Pipe & fgs
Martech Marketing	www.martechmarketing.com	Link Seal, Ribbons, Hymax
Mission	www.missionrubber.com	Fernco Couplings
Nilex	www.nilex.com	Geo Textiles
Pepco Tubular	www.pepcopipe.com	Pipe Insulation
Polytubes	www.polytubes.com	Ser200 Tubing
PSI	www.psipipelinesupply.com	Uniflanges, couplings
Raci	www.racispacers.com	Casing Spacers
Raintank	http://www.emcoltd.com/default.aspx?id=2521	
Rehau	www.rehau-na.com	Watermain, Sewer & Ultra Rib Pipe & fgs
Robar Industries	www.robairindustries.com	Couplings, Saddles, Restrainers, Repair Clamps, Tap Sleeves
Romac Industries	www.romac.com	Couplings, Saddles, Restrainers, Repair Clamps, Tap Sleeves
Royal/Leron	www.royalpipe.com	Watermain, Sewer & Ultra Rib Pipe & fgs
Sealguard	www.sealguardinc.com	Manhole Leak Repair
Spectrum Sales	www.spectrumsales.ca	Lennox Tools
Trojan Industries	www.trojanindustries.com	Cast Iron fgs, Manhole Frame & Covers, Service Boxes, Valve Boxes
Urecon	www.urecon.com	Pipe Insulation, Hydrant Barrel Insulation
Wildfire	www.wildfire-equipment.com	Hydrant Wrenches
W.R. Meadows	www.wrmeadows.com	Aqua Plug (quick dry cement)
APEGGA (Engineering & Geoscience - Alberta)	www.apegga.org	
BCWWA (BC Water & Waste Association)	www.bcwwa.org	
WCWWA (Water & Wastewater Association)	www.wcwwa.ca	
FCM (Federation of Canadian Municipalities)	www.fcm.ca	