



THE MANITOBA WATER SERVICES BOARD

LISTING OF APPROVED PRODUCTS

Unless otherwise specified, all products listed herein shall be suitable for 1000 kPa cold water service, certified to **NSF 61** international standards when in contact with potable water.

Listing of a particular make and model and/or trade name does not constitute automatic approval for that designation or restrict the Contractor from offering an alternative product, which complies with the specification. There may be specific material requirements (e.g., use of stainless steel nuts and bolts in hydrants, gate valves, couplings, etc.) and suppliers and contractors must refer to the Standard MWSB technical specifications to ensure that a particular unit being offered conforms completely to the specified requirements.

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UNDERGROUND PIPING WORKS

Part 1 HYDRANTS

A. Standards

- AWWA C502, ULC listed and FM approved 1000 kPa service.
- “dry top” bonnet, compression type valve closing with pressure, opening counter clockwise against pressure, 112 mm min. main valve size, 175 mm min. barrel size, 150 mm inlet boot size with joints as required, main valve removable by turning valve stem above groundline.
- hydrants shall have “O” ring seals to prevent water infiltration into housing during hydrant operation.
- self-draining barrel design with drain holes and plugs which can be removed by removing hydrant internals.
- two 63.5 mm hose nozzles, one 100 mm pumper nozzle, WCU standard threads and nuts, nozzle caps with nuts and with steel cable or chains, hose and pumper nozzles shall be field replaceable, nozzles between 400 and 550 mm above groundline, frangible section at 50 to 100 mm above groundline.
- 316 stainless steel nuts and bolts below groundline.
- chrome yellow or Chinese red, with black caps and bonnet.
- minimum 2.5 metre barrel for 2.75 metre bury (invert to groundline); longer barrels or extensions as required for deeper burial as may be specified.
- bronze to bronze seat in compliance with AWWA C502 to allow for removal of the seat.
- hydrant shall allow for external lubrication of housing and operating system without removal or disassembly of the housing from the hydrant.

B. Approved Models

- | | |
|--------------------------|---|
| 1. American Flow Control | Model B84B-5 (Darling) |
| 2. AVK | 2700 Modern Style Dry Barrel
2780 Nostalgic Style Dry Barrel |
| 3. CLOW Canada | Brigadier M67, Eddy, Medallion, Premier |
| 4. Mueller | Centurion (Modern and Super), Canada Valve Century,
Darling |

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Part 2 GATE VALVES

A. Standards

- Sizes 50 mm (2") to 300 mm (12")
- conform to AWWA C509/515 latest revision and ULC & FM listed. Resilient seat, rated at 1000 kPa (water) or 700 kPa (forcemain) or 500 kPa (low pressure sewer) working pressure service.
- cast iron or ductile iron body, type 316 stainless steel trim, nuts and bolts. Internal and external epoxy coated to AWWA 550 (latest revision). Counter clockwise opening with non-rising spindle suitable for extension spindle/service box.
- joints as required for pipe being used.
- discs shall be 100% encapsulated by rubber (no hollowed crevices inside to trap water).
- bronze stem nuts shall be isolated by encapsulated rubber disc same as bronze stem (per AWWA C509).
- stuffing boxes shall be O-ring sealed.
- valves shall allow for full size cutters during tapping operations.

B. Approved Models

- | | | |
|----|-----------------------|---|
| 1. | American Flow Control | Series 2500 (AWWA C515 Resilient Wedge) |
| 2. | AVK | (AWWA C509 Resilient Wedge) (also including HDPE Stub ends) |
| 3. | CLOW Canada | Resilient Wedge Valve (AWWA C509) F6102 (Flanged)
Resilient Wedge Valve c/w polyethylene pipe ends (AWWA C509) |
| 4. | MA Stewart | W Series |
| 5. | Mueller | AT2360 Series Resilient Wedge Gate Valve (AWWA C509) |

Part 3 VALVE BOXES

A. Standards

- cast iron upper box with cast iron lid, stone collector, stone disc, 25 mm square extension spindle with 50 mm square socket, adjustable for 2.5 to 3.0 metre cover

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over pipe (or as required in specs), with bituminous coating on all cast iron parts (AWWA C151, Sec. 51-7-3).

- PVC Schedule 40 125 mm diameter and PVC Schedule 80 CSA B137.3 Valve Box Bottom lower section (minimum 150 mm inside diameter) with flared bell for valve bonnet.
- hinged lid shall be marked with a raised letter “W” to represent a water valve. Lids shall also be available with an “S” for use on sewermain valves.

B. Approved Models

- | | |
|--------------------------|---|
| 1. Karoh Castings | KR001 and KR001C |
| 2. Mueller | MVB Composite Valve Box MVB 070C, 090C, 110C and 130C |
| 3. Titan Foundry | Type “E” |
| 4. W.D. Industrial Group | WD82, WD82 PI |

Part 4 REPAIR CLAMPS

A. Standards

- wrap around “O” style, pressure ratings as in Part 2.
- all fully chemically passivated type 304 stainless steel metal parts and welds.
- bolt shanks forged flat, rolled type bolt threads lubricated by anti-galling compound, nuts and washers connected to turn independently without separating.
- rubber gasket (with tapered ends, gridded surface, stainless steel armors) Virgin SBR to ASTM D2000 made of synthetic equivalent to natural rubber.
- clamp lengths and bolt arrangements as specified.

B. Approved Models

- | | |
|-----------------------|---|
| 1. Cambridge Brass | 425 Series
435 Series
825 Series
835 Series |
| 2. Cascade Waterworks | Style CR1, CR2 and CR3 Type 304 Stainless Steel |
| 3. Ford Meter Box | FS1 and FS2 All Stainless Steel Repair Clamps |
| 4. Mueller | 510 and 520 Series Stainless Steel |
| 5. Robar | 5616 (single section) and 5626 (two piece) Type 304 Stainless Steel |

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6. Romac Models SS1 and SS2 Clamp Style 304 Stainless Steel

Part 5 COUPLINGS

A. Standards

- epoxy or nylon coated ductile iron body (for bury applications), suitable for pressures as in Part 2.
- centre rims and end plates of ductile iron (ASTM A536) with epoxy coating (for in-ground bury application).
- virgin rubber or (ASTM D2000 SBR) gaskets.
- nuts, bolts, washers to be all stainless steel 304/316 with plastic thread protector caps or zinc anode nuts if specified.
- for PVC to PVC connection, PVC couplings are preferred, see Part 14 “Pressure Pipeline Fittings”.
- couplings must withstand up to 6-degree deflection.

B. Approved Models

1. EBAA Iron Inc. Mega Coupling Series 3800 (Restrained Coupling) c/w stainless steel bolts
2. Ford Meter Box FC1 and FC2A (for PVC to AC transition) with ESH designation SC2W
3. GF Piping Systems Multi/Joint 3000 plus Restraint Coupling NSF61 c/w epoxy powder coating and all steel nuts and bolts & washers
4. HYMAX Coupling DI High Pressure
Grip restraining coupling (for HDPE and PVC)
5. Robar 1406/1506 Cast Coupling with 9620 stainless steel inserts
1596 Vantage
1696 – 2B Coupling
6. Romac Model XR 501 Cast Coupling
Alpha Coupling (NSF 61)
7. Smith-Blair 411 Steel Coupling
421 Top Bolt Coupling
461 and 462 Quantum (CP)
470 Series Steel
921 Top Bolt Flange Coupling Adapter
8. Victaulic 904 (HDPE to Flanged Pipe)

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- 905 (HDPE)
907 (HDPE to Steel)
908 (HDPE)
9. Viking Johnson MaxiFit c/w stainless steel nuts, bolts and washers
 MegaFit c/w stainless steel nuts, bolts and washers

Part 6 SERVICE SADDLE/CLAMPS

A. Standards

- double strap type or wide band type, or all bronze wide body with all metal parts to be stainless steel 304/316 or ASTM-B62 bronze, minimum bolt size 10 mm Ø.
- rubber compression gasket.
- saddle to have standard corporation threaded outlet or NPT threaded outlet as specified.
- fully passivated all stainless steel 304/316.

B. Approved Models

1. A.Y. McDonald 3891 brass hinged saddle
2. Cambridge Brass 812 Series
 8403 Series
3. Canada Pipeline Canpac Models SC1 and SC2 all stainless steel
4. Cascade CSC1 and CSC2
5. Ford Meter FS303 stainless steel
 S70 and S90 Brass
 202BS bronze body and all stainless steel band, nuts, bolts and
 washers for C900 pipe
6. Robar 2616 Series all stainless steel
7. Romac 304 (single bolt) all stainless steel
 306 (2 bolt) all stainless steel
8. Mueller Bronze slip-hinge for C900 and Mueller all bronze for IPS PVC
 Bronze wide range for cast iron, ductile iron, cast iron O.D. PVC
 C900
 Bronze wide band stainless steel BR Series and single or double
 strap
 Stainless steel saddles 100 mm to 300 mm
9. Smith-Blair 370 stainless steel Service Saddle

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Part 7 CORPORATION (MAIN) STOPS

A. Standards

- corporation threaded inlet, flared copper-to-copper or compression outlet.
- all brass/bronze parts and in accordance with AWWA-C800.

B. Approved Models

1. Cambridge Brass Model 301 (ball style)
2. Ford Meter Box Type FB1100
Type F1000
Type FB600
Type FB1000 (ball style)
3. Mueller A-220 and H-15008 groundkey (19 mm and 25 mm)
B-25008 ball type (25 mm, 38 mm and 50 mm)
H15013 Oriseal Corp Stop (38 mm and 50 mm)
4. A.Y. McDonald 4701 B Ball Style

Part 8 CURB STOPS AND BOXES

A. Standards

- non-draining.
- flare copper-to-copper or compression type inlet and outlet.
- all brass/bronze parts on stop in conformance with AWWA C800
- box to be cast or black iron, galvanized or steel, adjustable for 2-3 metre cover, with arch type polymer plastic boot.
- lid to be ribbed cast iron with 25 mm brass plug with ACME thread and pentagon nut 22 mm flat-to-point.
- stationary rod all stainless steel 12 mm diameter, all welding fully passivated, 1.8 to 2.1 metres long, upper end forged to 13 mm x 19 mm section to fit operating key and shaped to position the rod in central position in box.
- top forged section to be parallel to bottom yoke to provide positive indication of “on” or “off” position.
- bottom of rod to provide yoke suitable for size of curb stop (19 mm to 50 mm); yoke to be drilled to accept 5 mm dia-brass or stainless steel cotter pin.

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B1. Approved Models (Curb Stops)

1. Cambridge Brass Model 202 (ball style) CTS
6100-44 Series (ball) IPS
2. Ford Meter Box B77-666 (non-drain)
B77-777 (non-drain)
B11-777 (non-drain)
B11-555 (non-drain)
B44 Series
3. Mueller H-15214
H-15219 (draining) Oriseal Mark II
H-15209 (non-drain)
H-15204 (non-drain)
H10283 (non-drain)
A617 and H15217 Inverted Key 19 mm & 25 mm only
A616 (non-drain) 19 mm & 25 mm
A617 and H15217 Inverted Key 19 mm & 25 mm only
4. A.Y. McDonald 76100 NL (non-draining)
76000Q NL (draining)
5. Lateral Connection Corp GR1125SS
GR30150SS
GR6211SS

B2. Approved Models (Boxes)

1. Karoh Castings Service Box
2. Mueller A726
A728
A-718 (19 mm, 25 mm and 32 mm)
A-573 (38 mm and 50 mm)
A719 (600 mm upper section, short base for 19 mm and 25 mm curb stops)
A619 (600 mm upper section , short base for 38 mm and 50 mm curb stops)
3. PCHG Products Models D1SB
D1GP (small base) Polymer Boot
D2SP (large base) Polymer Boot with SSRC (304 stainless steel rod & cotter pin)
TSBL Threaded Curb Stop Top Casting c/w Brass Plug and Set

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- Screw
A617 and H15217 Inverted Key 19 mm & 25 mm only
A616 (non-drain) 19 mm & 25 mm
A617 and H15217 Inverted Key 19 mm & 25 mm only
4. Titan Foundry SSB1 Small Polymer Boot
SSB2 Large PVC Boot
5. WD Industrial SB20C (19 mm and & 25 mm)
SB25C (38 mm)
VB31 (38 mm and 50 mm)

Part 9 PRESSURE PIPE POLYVINYL CHLORIDE (SERIES)

A. Standard

- ASTM D1784, ASTM D2241, CSA B.137.3, Series 160 SDR 26 (water) or Series 125 SDR 32.5 (sewage).
- integral bell with push-on bell and spigot joint.
- maximum pipe length 6 metres.
- CSA Certification Logo on every length of pipe

B. Approved Makes

- | | |
|-----------------------------|-------------------------------------|
| 1. Diamond Plastics | Series Pipe (bell & spigot) |
| 2. IPEX | Series Pressure Pipe |
| 3. Westlake Pipe & Fittings | Series Pressure Pipe |
| 4. Next Polymers | Aqualoc Series Pipe (bell & spigot) |
| 5. Northern Pipe Products | Series Pipe (bell & spigot) |

Part 10 PRESSURE PIPE POLYVINYL CHLORIDE (CLASS)

A. Standard

- AWWA C900, Class 235 (water), Class 165 (sewage)
- push-on bell and spigot joint
- maximum pipe length 6 metres
- AWWA C905 large diameter pressure pipe (350 mm to 900 mm)

B. Approved Makes

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- | | |
|-----------------------------|--|
| 1. Diamond Plastics | AWWA C900 Pipe
AWWA C905 Pipe |
| 2. IPEX | TerraBrute CR Restrained Joint
Blue Brute (AWWA C900)
Centurion (AWWA C905) large diameter |
| 3. Westlake Pipe & Fittings | AWWA C900 Pipe
Cert-Lok RJIB |
| 4. National Pipe | Dura-Blue C900 |
| 5. Next Polymers | Aqualoc Pipe (bell & spigot) |
| 6. Northern Pipe Products | AWWA C900 Pipe |

Part 11 PRESSURE PIPE POLYETHYLENE

A. Standards

- shall be in accordance with ASTM D3350 Cell Classification Hydrostatic Design Basis (HDB) 1600 psi at 73°F and hydrostatic strength (HDS) of 800 psi at 73°F or NSF 61 with NSF, ASTM F714 or CSA B137.0 and B137.1
- shall be made from virgin compound (with the exception that it may contain clean rework compound generated in the manufacturer's own plant from resin compound of the same class and type from the same raw material supplier) having a minimum 100,000 hours of stress resistance at a pressure of 11 MPa
- the minimum wall thickness of the pipe shall be not less than the value of "t" as determined by the formula:

$$t = (P) (OD) / (2 (S+P))$$

where t = wall thickness (in mm)

p = pressure rating (in kPa)

OD = outside diameter (in mm)

S = design stress (kPa)

- the wall thickness shall not be less than 4.32 mm for pipe size 75 mm and smaller
- the pipe shall be permanently and legibly marked as per the applicable standard in such a way as not to lower the quality of the pipe
- the pipe shall be manufactured of Type III high density (S.G. .941 to .955 resin compound of the type qualified as PE4710
- high density polyethylene pipe identification shall be placed on each length of pipe

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and shall include pipe size, manufacturer's trademark or name, date of manufacture, series or DR rating, Canadian Standards Association, NSF International Certification or Water Quality Association (WQA) complete with certification trademark logo and the CSA:ASTM specification standard to which the pipe is certified. Certification of polyethylene pipe using NSF shall be to both NSF 61 and NSF 14 requirements

- flange assemblies to be: stub end complete with stainless steel or epoxy coated ductile iron backup ring drilled to AWWA C110 and reinforced rubber gasket and stainless steel nuts, bolts and washers
- insulation (if required) factory as per Part 22, Pipe Insulation

B. **Approved Makes**

- | | |
|--|--|
| 1. Dura-Line | HDPE PE4710 (in smaller pipe sizes) |
| 2. Infra Pipe Solutions | Sclairpipe HDPE PE4710 |
| 3. International Pipe Inc. | 50 - 150 mm Ø |
| 4. Performance Pipe (Chevron Phillips) | DriscoPlex 4000 / 4100 (potable water) |
| 5. Pipeline Plastics | HDPE PE4710 |
| 6. Polytubes Pipe | HDPE PE4710 |
| 7. Shawcor | HDPE PE4710 |
| 8. WL Plastics | HDPE PE4710 |

Part 12 **WATER SERVICE CONNECTION PIPE**

A. **Standards**

1. Copper Pipe - type K soft, conforming to current AWWA Standard C-800 Appendix of Collected Standards for service line materials
2. High Density Polyethylene Pipe:
 - shall be in accordance with and marked CSA B137.1 for PE Pipe c/w CSA Warnock Hersey/or NSF International Certification Logo. High Density Service Pipe with required stainless steel insert for compression connectors.
3. Low Density Polyethylene Pipe:
 - shall be in accordance with CSA B137.0 Series 100 c/w CSA Certification logo
 - polyethylene pipe connector shall be used with all low density polyethylene small diameter service pipe when connected to fitting or as otherwise

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recommended by the pipe manufacturer either type 304SS clamps and nylon insert or B-62 bronze insert and Type 304SS clamp combinations.

3. Composite Water Service Tubing
 - aluminum tubing laminated between two layers of polyethylene in accordance with CSA 137.9 ASTM 1282 and NSF 61 c/w CSA, Warnock Hersey/or NSF International Certification Logo.
4. Cross-Linked Polyethylene (PEX) Pipe
 - shall be in accordance with CSA B137.5 NSF 61 and ASTM F876 c/w CSA Certification Logo.

B. Approved Makes

1. IPEX Blue904
2. Great Lakes Copper Type K Copper pipe
3. Rehau (PEX) Municipex
4. Mueller Type K Copper pipe

Part 13 RIGID TRENCH INSULATION (BURIED PIPE)

A. Standards

- conform to CGSB-51-GP-20M Type 4 rigid extruded polystyrene foam, with compression strength of 175 kPa

B. Approved Makes

1. Dow Chemical HI-40 (blue in colour)
2. Owens Corning Foamular (400)

Part 14 PRESSURE PIPELINE FITTINGS

A. Standards

- grey cast iron, 1000 kPa service, AWWA C110, joints compatible with pipe being used.
- all stainless steel nuts, bolts, and washers when flanged or mechanical joints are specified.

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- PVC fittings of similar type as pipe may be used on C900 or Series PVC pipe (injection moulded or fabricated and FRP reinforced) C900 fittings with C900 pipe and Series fittings with Series pipe.
- P.E. fittings of same quality and pressure rating as pipe. Injection moulded or fabricated with FRP reinforcement for both thermal butt fusion, electro fusion and socket fusion application.

B. Approved Makes

- | | |
|--|--|
| 1. Galaxy Plastics | PVC DR18 and DR25 Injection Moulded Fittings |
| 2. GF Central Plastics | HDPE Electrofusion fittings |
| 3. Harco | PVC fittings 100 mm to 200 mm injection moulded (or larger) for C900 and Series PVC pipe (fabricated and FRP reinforced for larger sizes) |
| 4. Integrity Fusion Products | HDPE butt fusion and electrofusion fittings |
| 5. IPEX | PVC fittings 38 mm to 200 mm injection moulded (or larger) for C900 and Series PVC pipe (fabricated and FRP reinforced for larger sizes)
Friatec Electrofusion for HDPE |
| 6. NUPI | HDPE Electrofusion fittings |
| 7. Performance Pipe (Chevron Phillips) | HDPE pipe fittings, injection moulded 19 mm to 300 mm fabricated 300 mm and larger |
| 8. Rahn Plastics | Injection moulded fittings 50 mm and larger |
| 9. Sigma | Cast iron ASTM A48 Grade 25B and 30B AWWA C110 complete with all stainless steel nuts, bolts and washers when flanged, otherwise ends to be Ringtite or Tyton |
| 10. Specified Fittings Inc. | utilizing PE4710 resin to ASTM F714, 1248, D3350, D3035 and D3261 |
| 11. TEGA | Electrofusion coupling NSF61, PE4710 material SDR9 to ASTM F714 and AWWA C901 |
| 12. Terminal City | AWWA C110 complete with all stainless steel nuts, bolts, and washers (when flanged) otherwise ends to be Ringtite or Tyton |

Part 15 SERVICE PIPE FITTINGS

A. Standards

1. High Density Polyethylene Pipe c/w stainless steel inserts

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- Brass Compression Fittings as per AWWA C800 c/w stainless steel insert fittings
- 2. Low Density Polyethylene Pipe
 - HD Brass insert as per AWWA C800 c/w 2 each stainless steel worm drive clamps per insert
 - Nylon insert c/w two (2) each stainless steel worm drive clamps per insert
- 3. Copper Pipe
 - Brass Compression Insert as per insert as per AWWA C800
- 4. Composite Water Service Tubing
 - Composite Brass Fitting in accordance with AWWA C800
- 5. Cross Linked Polyethylene c/w stainless steel inserts

B. Approved Makes

1. A.Y. McDonald
2. Boshart (brass)
3. Cambridge Brass
4. Ford Meter Box
5. Integrity Fusion Products
6. Mueller
7. Queensway Plastic (nylon)

Part 16 PVC SEWER PIPE AND FITTINGS

A. Standards

- ASTM D2241 and ASTM D3034 CSA B182.1 Plastic Drain and Sewer Pipe and Pipe Fittings and CSA 182.2 PVC Sewer Pipe and Fittings for SDR 41, SDR 35 or SDR 28 pipe as may be specified, with push-on bell and spigot
- maximum pipe lengths, 6 metres

B. Approved Makes

- | <u>Pipe</u> | |
|-----------------------------|-----------------------------|
| 1. Diamond Plastics | PVC SDR35 |
| 2. Galaxy Plastics | Gravity Sewer Fittings |
| 3. IPEX | Ring Tite Gasket Sewer Pipe |
| 4. Westlake Pipe & Fittings | PVC DR 35 |
| 5. Next Polymers | Duraloc |

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Fittings

- | | |
|-----------------------------|---|
| 1. GPK Products | Injection moulded or fabricated, FRP reinforced |
| 2. Harco | Injection moulded or fabricated, FRP reinforced |
| 3. IPEX | Gasketed Fittings |
| 4. Westlake Pipe & Fittings | Fittings |

Part 17 LARGE DIAMETER PROFILE PVC SEWER PIPE AND FITTINGS

A. Standards

- manufactured in accordance with current ASTM Standard 794 “Standard for Ribbed PVC Sewer Pipe and Fittings” and CSA 182.4 Standard Specifications for large diameter gravity sewer pipe and fittings based on controlled inside diameter.
- the pipe cell classification shall be 12454-B in accordance with ASTM D1784. Fittings shall be injection moulded to ASTM D3034 and CSA 182.1 and ASTM F679 and CSA B182.4.
- gaskets shall be in accordance with CSA 182.4 and ASTM F477.

B. Approved Makes

- | | |
|-----------------------------|------------------------------------|
| 1. IPEX | Ultra Rib sizes 200mm thru 600mm Ø |
| 2. Rehau | Raurib sizes 200mm thru 600mm Ø |
| 3. Westlake Pipe & Fittings | Kor-Flo |
| 4. Mueller Flow Control | |

Part 18 LARGE DIAMETER PROFILE POLYETHYLENE SEWER PIPE AND FITTINGS

A. Standards

- high density polyethylene compound PE3408 ASTM1248, ASTM3350 cell material classification 345434C.
- ring stiffness in accordance with ASTM F-894. Pipe stiffness in accordance with CSA B182.6 minima 320 kPa at 5 per cent deflection.

B. Approved Makes

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1. Armtec Big-O POLYTITE
Boss 2000
2. Infra Pipe Solutions Weholite

Part 19 LARGE DIAMETER PROFILE POLYPROPYLENE SEWER PIPE AND FITTINGS

A. Standards

- specification for smooth walled 300 to 1500 mm polypropylene pipe for use in gravity-flow storm drainage applications
- polypropylene compound for pipe and fitting production shall be impact modified copolymer meeting the material requirements of ASTM F2881, Section 5 and AASHTO M330, Section 6.1.
- installation shall be in accordance with ASTM D2321 and manufacturer's recommended installation guidelines
- joint Performance Pipe shall be joined using a bell & spigot joint meeting the requirements of ASTM F2881 or AASHTO M330. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477.
- fittings shall conform to ASTM F2881 or AASHTO M330. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

B. Approved Makes

1. ADS Canada SaniTite Polypropylene Pipe

Part 20 CONCRETE SEWER PIPE AND FITTINGS

A. Standards

- up to 450 mm diameter: ASTM C14-3.
- 525 mm diameter and larger: ASTM C76, Class II (or as specified).
- rubber gasket joint for up to 525 mm diameter.
- rubber gasket, "ram-nek" or Kent Seal No. 2 on 600 mm to 1350 mm.
- "ram-nek", Kent Seal No. 2 or mortar joint on pipe larger than 1350 mm diameter.
- CSA A5-M Type 50 Sulphate resisting cement.

Effective Date: March 2022



B. Approved Makes

1. Inland Pipe
2. LaFarge Canada Inc.

Part 21 MANHOLES AND CATCH BASINS

A. Standards

- precast reinforced concrete, ASTM C478
- Concrete to be sulphate resistant
- “ram-nek” or Kent Seal No. 2 gaskets.
- cast-in-place galvanized steel or aluminium manhole rungs @ 300 mm o.c. spacing.
- cast iron hood, hinge and pin in catch basins.
- type 2 manhole (for sewer up to 600 mm diameter) to have 1200 mm diameter x 1.22 metres high base with precast floor 1200 x 1200 x .91 barrel. 1200 mm x 900 mm diameter x .23 metres high flat top reducer and 900 mm diameter risers as required and 900 mm flat top reducer for frame and cover unit.
- PVC catch basin utilizing thermoforming process to conform to ASTM D1784 cell class 12454/ Connection stubs to provide watertight connection and joint tightness shall conform to ASTM D3212. Flexible elastomeric seals shall be ASTM F477.

B. Approved Makes

1. ADS Canada Nyloplast Drain Basin
2. Inland Pipe
3. LaFarge Canada Inc.

Part 22 MANHOLES AND CATCH BASINS, FRAMES AND COVERS

A. Standards

- cast grey iron; castings to be true to required pattern (City of Winnipeg standards), free of cracks, gas holes, flaws, and excessive shrinkage; casting surfaces to be free from burnt-on sand and to be smooth; runners, risers, fins to be removed.
- units installed in roadways and other areas subject to traffic to be “machined” for close tolerance fit.

Effective Date: March 2022



- ductile iron cover for PVC shall be ASTM A536 grade 70-50-05 and support H-20 loads.
- composite manhole frames and cover shall be non-corroding, non-conductive lightweight design for both cover and frame, meet HS25 specifications and be lockable with 304ss bolts.

B. Approved Makes

- | | |
|--------------------------|---|
| 1. Karoh Castings | Manhole Frame KR006
Manhole Cover KR007 |
| 2. Sigma Corporation | |
| 3. Titan Foundry | TF101M |
| 4. W.D. Industrial Group | Model WD50F
Composite WD50FC-6 &WD50SC (not approved for roadways) |

Part 23 PIPE INSULATION

A. Standards

- factory applied closed cell rigid polyurethane foam, $K = 0.032 \text{ KJ/hr.m}^2\text{.C.mm}$, bonded by adhesive water repellent rubber sealant to a high density polyethylene outer sheath; 1.27 mm (50 mil) thick unless 1.91 mm or 2.52 mm (75 or 100 mil respectively) specified in contract specifications; complete with insulation kits and heat shrink sleeves at joints in accordance with ASTM D2856.

B. Approved Make

- | | |
|-------------------------|------------------------------------|
| 1. Perma-Pipe | Xtru-therm |
| 2. Shawcor | Yellow jacket
Insul-8
Canusa |
| 3. Thermacor Process | Polycor |
| 4. Thermal Pipe Systems | |
| 5. Urecon | U.I.P. System |

Effective Date: March 2022



Part 24 CULVERT PIPE

A. Standards

Precast Concrete Pipe

Concrete culvert pipe and fittings shall be extra strength concrete conforming to current ASTM Standard C14-3 Standard for Unreinforced Concrete Pipe for pipe up to 450 mm in diameter. Pipe and fittings shall be Class II reinforced concrete conforming to the current ASTM standard C76 Standard for Reinforced Concrete Pipe, for pipe 525 mm in diameter and larger each length of pipe of 150 mm to 2700 mm in diameter and larger shall be complete with rubber gasket. Pipe shall not exceed 3 metres per length.

Corrugated Steel Pipe

All steel pipe and pipe arch materials shall conform to CSA G401 and the current CSP1-501 Specification for corrugated pipe culverts and pipe arches. Corrugated pipe and pipe arches shall be hot dipped galvanized. Pipe dimensions shall conform to the following:

INTERNAL DIAMETER (mm)	PIPE GAUGE	COUPLING GAUGE
150	16	16
200	16	16
250	16	16
300	14	16
375	14	14
450	14	16
525	14	16

Effective Date: March 2022



600	14	16
750	12	14
900	12	14
1050	10	12
1200,1350,1500	8	10
914.4 X 558.8 (pipe arch)	12	10

High Density Polyethylene Pipe shall be constructed in accordance with one or more of the following standards: Can/CSA B182.8, ASTM D3350, ASTM F894, ASTM F477 and shall have a minimum pipe stiffness of 210 kPa in accordance with CAN/CSA B18 AASHTO M294. Interior of pipe shall have a Manning smoothness “n” from 0.010 to 0.012. Joining system shall be bell and spigot, gasketed or extrusion welded.

B. Approved Makes

Concrete Culverts

1. LaFarge Canada Inc.
2. Inland Pipe

Steel Culverts

1. Armtec
2. Westman

Polyethylene Pipe

- | | |
|-------------------------|---|
| 1. ADS Canada | Corrugated, dual wall HPPE Storm Drain Pipe |
| 2. Armtec | Big-O |
| | Boss 2000 |
| 3. Infra Pipe Solutions | Weholite |
| 4. Soleno | Flo Max |

Effective Date: March 2022



Part 25 FOUNDATION DRAINAGE PIPE

A. Standards

1. Polyethylene Pipe and Fittings
 - shall conform to ASTM F405 and F667
2. PVC Pipe and Fittings
 - shall conform to CSA B182.1 and 182.2

B. Approved Makes

- | | |
|------------|--|
| 1. Armttec | Big-O drainage tubing with filter sock |
| 2. IPEX | PVC perforated c/w filter sock |

Part 26 AIR RELEASE VALVES

A. Standards

- stainless steel, epoxy coated steel or cast iron body with threaded inlet
- stainless steel trim and float
- inlet and outlet size as specified

B. Approved Makes

- | | |
|-----------|--|
| 1. A.R.I. | D-090-P Underground Combination Air/Vacuum Valve |
| 2. H TEC | 992 Ha Vent Automatic Self Contained Air Valve Set |
| | 986 Automatic Air & Vac Valve for Wastewater |

Effective Date: March 2022



ABOVE GROUND PIPING WORKS

Part 1 JOINTS

A. Standards

- flanges - AWWA C110, C115, C207; with stainless steel nuts, bolts, washers; with red rubber full face gaskets.
- mechanical Joint Type Adaptor Flanges - AWWA C110, C111; with stainless steel nuts, bolts, washers.
- grooved and Shouldered Joints - AWWA C606.
- threaded Joints - “NPT” type (National Pipe Thread Standard).
- solvent Welded Joints - ASTM D2564.

B. Approved Models

- | | |
|-----------------------------|--|
| 1. ASC Engineered Solutions | Gruvlok |
| 2. CLOW Canada | Series 40 and Series 90 (epoxy coated) |
| 3. Ford Meter Box | Uni-Flange |
| 4. Romac | Field flange for ductile ips sizes |
| 5. Victaulic | Style 741/743 Flange Adapter |

Part 2 STEEL PIPE AND FITTINGS

A. Standards

- seamless black steel, grade B, AWWA C200, AWWA C208, ASTM A53.
- welded black steel grade B ASTM A53

B. Approved Makes

1. Bentler
2. Mittel Canada Inc.
3. Stelco

Effective Date: March 2022



Part 3 IRON PIPE AND FITTINGS

A. **Standards**

- AWWA C110
- AWWA C115

B. **Approved Makes**

1. Anvil International Inc.
2. BMI
3. M.A. Stewart

Part 4 PVC PIPE

A. **Standards**

- ASTM D1784, ASTM D1785, CSA B137.0, CSAB137.3; Type 1, Grade 1, PVC 1120; Schedule 80 unless otherwise specified.

B. **Approved Makes**

1. IPEX/Spars
2. Westlake Pipe & Fittings
3. Rehau

Part 5 FLEXIBLE HOSE

A. **Standards**

- flexible, for full vacuum and up to 500 kPa positive pressure.
- heavy duty black rubber over heavy gauge fabric and heavy rubber coated steel wire reinforcement.
- smooth, non-porous tube.
- capable of bending to five times the nom.i.d. in cold temperatures

B. **Approved Models**

Effective Date: March 2022



- | | |
|------------------------------------|-----------------------------------|
| 1. B.F. Goodrich | Type 33 (Cat. Fig. 3550) |
| 2. Brothers Industrial Supply Ltd. | Tigerflex |
| 3. Goodyear | Belterra |
| 4. Industrial Hose | Plicord Extreme Flex (food grade) |
| 5. Water Suction Hose | LHRWS300CA-N-090 |

Part 6 BUTTERFLY VALVES

A. Standards

- 50 mm and less-cast iron body, 304 stainless steel thru stem, bronze disc, Buna-N rubber seal, epoxy coated, manual squeeze operating lever, s/s notched position plate. All gear box oils or grease shall be non-toxic when submerged in potable water reservoirs.
 - i) Manual - wafer style cast or ductile iron body, bronze or stainless steel alloy 304/316 disc and stem, EPDM seat, Buna-N seals; 50 - 150 mm, hand lever with notched position locks; 150 mm and larger, handwheel and heavy duty gear operator.
 - ii) Valves greater than 300mm Ø, valves shall meet AWWA C504, flanged ductile iron disc (epoxy coated). Class 150B or 250B dependent on pressure rating equipment.
 - iii) Automatic (pneumatic) or electric type actuators - as above, with position indicator, integral positioner, spring, electric or pneumatic control, manual gear override.

B1. Approved Small Size Valves

- | | |
|-----------------|--------------------------------------|
| 1. Apollo | |
| 2. CLOW/M&H | |
| 3. Crispin | K- Flo 47 Series
K-Flo 500 Series |
| 4. Elite | |
| 5. Jamesbury | |
| 6. Keystone | Resilient Seat |
| 7. Kitz | |
| 8. M.A. Stewart | D Series (CSH and NSF) |
| 9. Mueller | Line Seal III |
| 10. Pratt | BF Series |

Effective Date: March 2022



B2. Approved Large Size Valves Up To 300 mm Ø

- | | |
|--------------------------|---|
| 1. Bray | Series 30/31 |
| 2. CLOW/M&H | |
| 3. Corix Industries Ltd. | Challenger |
| 4. Crane | Regent 50-B4E-AG
Centerline 200 Series |
| 5. Crispin | F47
500 |
| 6. DeZurik | |
| 7. Keystone | Fig. 221 wafer and Fig. 222-786 lug |
| 8. Jamesbury | |
| 9. Keystone | Resilient Seat |
| 10. Kitz | DJ Series |
| 11. M.A. Stewart | D Series (CSH and NSF) |
| 12. Master gear | AWWA Submersible |
| 13. Mueller | Line Seal wafer |
| 14. Pratt | Groundhog |
| 15. Sure Flow Equipment | |

B3. Valves Greater Than 300 mm Ø

- | | |
|--------------|-------------|
| 1. Val-matic | Series 2000 |
|--------------|-------------|

B4. Approved Actuators

- | | |
|--------------------|---|
| 1. Apollo | CompacTorque pneumatic and AE electric |
| 2. Automax | Positioner and Limit Switch boxes |
| 3. Jamesbury/Metso | |
| 4. Keystone | |
| 5. Kitz | Model B and F Series |
| 6. KVC | c/w stainless steel disc |
| 7. Limitorque | |
| 8. M.A. Stewart | Air pneumatic and electro-hydraulic actuators |
| 9. Mueller | Line Seal wafer |
| 10. Pratt | Groundhog |
| 11. ProMation | |
| 12. Regler | WM Series |
| 13. Rotork | |

Effective Date: March 2022



14. Tyco

Part 7 BALL VALVES

A. Standards

- bronze, brass or stainless body, bronze, brass or stainless follower and bronze, brass or chrome plated ball; Buna-N or PTFE seal and seat; hand operating lever.

B. Approved Models

1. Anvil Mueller Model 171N-172N
2. Apollo
3. Aqua 313, 314, 5044ALF (lead free), 5049ALF (lead free)
4. Automax Positioner and Limit Switch boxes
5. A.Y. MacDonald Part 2032T
6. Boshart 0825NL
B11 Model 0827NL no lead Brass Ball Valve (threaded)
7. Cambridge Brass B11 0827NL
Model 210 NL c/w handle
8. Crane Capri 9302/9322
9. Flowtec Stainless steel body
10. Keywin Fast Ball Valve
11. Kitz 68, 58, 59, & 69
Lead free models 858, 859, 868AMLL and 869AMLL
c/w stainless steel disc
12. KVC
- 13.
14. M.A. Stewart B3& B4 and B3AB (lead free) and B4AB (lead free)
15. Milwaukee BA-100
16. Toyo/Red-White 5044A/5049A Lead Free
17. Watts Model B-6000

Part 8 BALL VALVES (PVC)

A. Standards

- PVC body (ASTM, D1784, D1785, D2466, D2467)
- EPDM or Teflon seat

Effective Date: March 2022



- hand operating lever

B. Approved Models

- | | |
|-------------------|--|
| 1. A.Y. MacDonald | 2064 ST-PVC Union Ball Valve |
| 2. Chemline | True Union type |
| 3. Hayward | |
| 4. IPEX | VXE (12 mm to 50 mm) and VKD (62 mm to 100 mm) |
| 5. Nibco | Chemtrol 45 CE-E |

Part 9 GATE VALVES

A. Standards

- 50 mm and smaller - bronze body, rising stem, solid wedge disc, fully guided disc travel screwed bonnet, open rim multi-rib handwheel (AWWA C515 resilient wedge NSF61)
- larger than 50 mm - cast iron body, bronze stem and seat, disc travel guide ribs, rising stem, tapered seat, open rim handwheel. (AWWA C515 resilient wedge NSF 61)

B. Approved Models

50mm and smaller

- | | |
|-------------------|---|
| 1. A.Y. MacDonald | Model 2035T (non-rising) |
| 2. Canada Valve | 520 S and Y |
| 3. Crane | No. 428 |
| 4. Elite | Series 5100 |
| 5. Hammond | Part 606A |
| 6. Jenkins | Fig. 810 |
| 7. Kitz | Kitz 24 & 44 (Red and White)
827 (lead free) and 828 (lead free) |
| 8. Nibco | TE111 |
| 9. Toyo | 293 |

Larger than 50mm

- | | |
|--------------------------|-------------|
| 1. American Flow Control | Series 2500 |
|--------------------------|-------------|

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2. CLOW Canada	Flanged Resilient Wedge Gate Valve
3. Crane	No. 465
4. Elite	Series 5100
5. Hammond	
6. Jenkins	Fig. 454
7. Kitz	72
8. Mueller	R-2 365-6
9. Newco	Fig. 12F-1B7
10. Nibco	FE 617-0
11. Toyo	421A (rising stem)

Part 10 KNIFE GATE VALVES

A. Standards

- solid, one piece, cast iron, bonnetless, wafer style body
- type 18-8 stainless steel gate and stem
- cast iron/mild steel stuffing box and yoke
- neoprene packing, bronze stem nut, hand wheel
- all stainless or plated steel nuts and bolts

B. Approved Models

1. DeZurik	Series L and C
2. Emerson-Keystone	PCS17
3. Fabri	C67
4. Flow Control Components	Fig. 83B (metal seat) and 84B (resilient seat) Gate Fig. 73 & 74, 83 and 84
5. Kennedy	Figure 602
6. Mueller	No. GR 316 (Resilient Seat) No. GM 316 (Metal Seat)
7. ORB	Series 10 (resilient seat)
8. Pratt	LVC Fig 77 & 93
9. Red Valve	complete with cast iron body 316 stainless steel gate
10. SF	KG150 (Metal or Resilient Seat)
11. Trueline	

Part 11 GLOBE VALVES

Effective Date: March 2022



A. Standards

- bronze or brass body, renewable composition disc seating, screwed bonnet, handwheel.

B. Approved Models

1. A.Y. MacDonald 2017
2018
2. Crane No. 5
3. Kitz Models 12 & 03
Models 812 & 803 (lead free)
4. Nibco Models T211Y, T235Y, T275, S211Y, S235Y
5. Toyo Models 220 & 212

Part 12 SWING CHECK VALVES

A. Standards

- i) 50 mm and smaller - bronze body, Y-type design, 45° angle seating, two-piece composition all bronze rotating disc.
- ii) larger than 50 mm - AWWA C508, cast iron body and cap, Buna N seal, bronze (B62) or stainless steel hinge pins trim, cadmium plated steel external operating lever and weight or lever and stainless steel spring, plugs and bushing sealed by “O” rings. Swing check flanged body 50 mm - 100 mm bronze disc and seat ring, 100 mm - 600 mm grey iron disc ASTM 126 all bronze disc and seat ring. Sewage collection valve shall consist of a rubber seat; otherwise bronze seat rings are acceptable.
- iii) wafer style - bronze disc, cast iron body, type 316 stainless steel hinge and spring, Buna-N rubber “O” ring, stainless steel or bronze spacer, cadmium plated steel external operating lever and fittings.

B. Approved Models

50mm and smaller

1. Crane No. 41
2. Febco Model 810 (25 mm)
3. Flow-matic Series 50 (Sewage)

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4. Kitz
Models 22 and 23
Models 822 and 823 (lead free)
5. Nibco
TE413B, SE413B
6. Toyo
Models 236 ALF & 237 ALF
Models 236A-LF (lead free) and 237A-LF (lead free)

Larger than 50mm

1. Apco
2. Canada Valve
52SC Series
3. CLOW (Kennedy)
4. Crane
No. 6439
5. Crispin
Series SWc
6. Flow-matic
Series 408 (sewage)
7. Mueller
A2600 Series
8. Nibco
FE 918B
9. Val-Matic

Wafer Style

1. Check-Rite
Model 12 CBT
2. Emerson-Keystone
3. MOYGRO
12A-16VW
4. Watts
Series 18

Part 13 SILENT CHECK VALVES

A. Standards

- cast iron body, bronze disc, stainless steel spring, Buna-N rubber seals
- wafer style or flanged globe style as specified

B. Approved Models

1. Anvil
Fig. 400 (wafer) Series and Fig. 500 (globe) Series
2. Apco
Series 300 and 600
3. Boshart Industries
17CV Bronze Inline Check Valve
4. Cla-Val
580 (Wafer)/581 (Globe)
5. Crispin
Globe and Wafer Style
6. Flomatic
Globe and Wafer style
7. Moygro
W12A-16V

Effective Date: March 2022



- | | |
|---------------------------------------|--|
| 8. Mueller | Model 71 |
| 9. SureFlo | Model CW-125/250 & CF 125 |
| 10. Val-Matic | 1400 & 1800 (Globe) |
| 11. Watts/ Mueller Steam
Specialty | Series 71
Series 94
101MAP (wafer)
105MAP (globe) |

Part 14 PVC CHECK VALVES

A. Standards

- PVC body; ASTM D1784, D1785, D2466, D2467
- Y-body style
- Schedule 40 or 80 as specified

B. Approved Models

- | | |
|-------------|-------------------------------------|
| 1. Chemline | YC Series and SC Series |
| 2. IPEX | YB (12mm to 100mm) Ball Check Valve |
| 3. Hayward | PVC Swing Check Valve |

Part 15 RESIDENTIAL DUAL CHECK VALVES

A. Standards

- 19 mm diameter or larger
- bronze female threaded
- in line, all position
- rated for pressure up to 1035 kPa
- stainless steel springs
- lead free

B. Approved Models

- | | |
|-------------------|----------------------|
| 1. Apollo | 4ALF-300
DUCFL 4A |
| 2. A.Y. MacDonald | 11 x 3 FE Series |

Effective Date: March 2022



- | | |
|-------------------|---|
| 3. Ford Meter Box | Dual check cartridge style with stainless steel internal, HHS and HHA models (compression type) |
| 4. Mueller | H14242
H14243
H14244 |
| 5. Wilkins (Zurn) | Model 700 |

Part 16 FOOT VALVES

A. Standards

- flanged or threaded cast iron body
- Buna-N rubber “O” ring
- bronze seat, plug, bushing and bushing retainer
- stainless steel seat retainer, nuts and bolts, screen and screen retainer

B. Approved Models

- | | |
|--------------|---|
| 1. Apco | Series 1400 |
| 2. Crispin | FV Series (c/w stainless steel nuts, bolts, parts as above) |
| 3. Flowmatic | Foot Valves (c/w stainless steel parts as above) |
| 4. Val-Matic | Sure Seal |
| 5. Watts | Model PV-10 |

Part 17 PRESSURE REDUCING VALVES

A. Standards

- ductile or cast iron globe style body
- epoxy coating
- threaded joints for 50 mm and smaller
- flanged joints on larger sizes
- replaceable stainless steel seat and stem
- reversible resilient polyurethane or EPDM disc
- reinforced synthetic rubber or EPDM diaphragm

Effective Date: March 2022



- pilot operated with low flow control - normally open direct acting
- brass pilot valve body with stainless steel seat and synthetic rubber disc and diaphragm

B. **Approved Models**

- | | |
|--------------|---------------|
| 1. Bermad | Model 720 |
| 2. Cla-Val | Series 90G-01 |
| 3. Flowmatic | Model C101 |
| 4. OCV | Series 127 |
| 5. Singer | Model 106-PR |
| 6. Wilkins | 500 Series |

Part 18 **PRESSURE RELIEF VALVES**

A. **Standards**

- single chamber hydraulically operated cast iron body
- threaded joints for 50 mm and smaller
- flanged joints for larger sizes
- replaceable stainless steel seat and stem
- reversible resilient polyurethane disc
- reinforced synthetic rubber diaphragm
- controlled by spring and diaphragm type pilot valve (normally closed direct acting)
- pilot valve with brass body, stainless steel seat and synthetic rubber or EPDM disc and diaphragm

B. **Approved Models**

- | | |
|--------------|---------------|
| 1. Bermad | |
| 2. Cla-Val | Series 50-01G |
| 3. Flowmatic | Model C401 |
| 4. OCV | Series 108 |
| 5. Singer | Model 106-RPS |

Effective Date: March 2022



Part 19 DIAPHRAGM VALVES

A. Standards

- straight through cast iron body
- threaded joints on 50 mm and smaller
- flanged joints on larger sizes
- soft rubber diaphragm liner
- manually operated models to have hand wheel

B. Approved Models

1. ITT Figs. 2401 and 2431 Weir
2801 and 2811 Straightaway types
2. Saunders Types A and B

Part 20 STRAINERS

A. Standards

- Y-type cast iron body
- for 50 mm and smaller, removable monel metal or stainless steel screen with 0.75 mm dia. openings and threaded joints
- for larger sizes, flanged body with heavy gauge brass sheet type screen with 1.5 mm dia. openings (3.0 mm for strainers larger than 100 mm)
- screen cover to be complete with threaded plugged blow off outlet

B. Approved Models (50 mm and smaller)

1. Colton 250 YTI
2. Kitz 15
3. Mueller H-9330 (12mm to 50mm)
4. Mueller Stream Specialties
5. Sure Flow Model T250-G
6. Toyo 380
7. Watts

Effective Date: March 2022



B2. Approved Models (large sizes)

- | | |
|-------------------|-------------------|
| 1. Colton | 125 YFI |
| 2. Kitz | 80 |
| 3. Mueller Stream | Specialties |
| 4. Singer | Model ZS Strainer |
| 5. Sure Flow | |
| 6. Toyo | 381A |
| 7. Victaulic | 732
W732 |

Part 21 WATER METERS

A. Standards

- 38 mm and smaller to have threaded joints
- larger sizes to have flanged joints
- to read in imperial gallons or cubic metres, as specified
- displacement type to conform to AWWA C700
- turbine type to conform to AWWA C701
- compound type to conform to AWWA C702
- electromagnetic flow meter type conforming to CSA 22.2
- ultrasonic flow meter type conforming to AWWA C751

B. Approved Models

- | | |
|---------------------------|---|
| 1. ABB | Water Master Electromagnetic Flowmeter to NSF61
Aqua Master Electromagnetic Flowmeter to NSF61 |
| 2. Badger | M-Series M2000
Record All Disc (Turbo and Compound Series) |
| 3. Carlon | |
| 4. Elster/AMCO (ABB-Kent) | C700BP
T3000
C-3000 (COMBO) |
| 5. Emerson | Rosemount Model 8750W |
| 6. Endress & Hauser | Proline Promag W 400 electromagnetic flowmeter |
| 7. ISOIL Industria | ISOMAG MS2500 |
| 8. Krohne | Enviromag 2000 Flowmeter (c/w Converter) |

Effective Date: March 2022



9. Master Meter Inc.	Multi-Jet BLMJ Octave Ultrasonic
10. Neptune	MACH 10 Ultrasonic C & I MACH 10 Ultrasonic Meter HP Turbine Tru-Flo Compound
11. Sensus	SR W Turbo Meter
12. Siemens	SITRANS

Part 22 RESIDENTIAL WATER METERS (C/W ENCODER AND REMOTE READ RECEPTACLE)

A. Standards

- Water meters shall be positive displacement, magnetically driven, for cold water application and conforming to the latest revision of AWWA Standard C-700 and C-707.
- The meter main case shall be non-corrosive water works bronze with raised markings to indicate direction of flow and size, have threaded ends and a synthetic polymer bottom plate for frost protection.
- Each meter shall be equipped with an encoder register for reading with a portable data interrogator unit from an inductive coupling type remote receptacle.
- The manufacturer shall submit a certificate showing each meter was tested for accuracy and conforms to AWWA C-700.

Each encoder register shall have but not be limited to:

- . permanently stamped serial number and either a programmable or fixed register identification number
- . ability to encode the registration and register identification number when interrogated with a portable data interrogator unit
- . data transmission shall be instantaneous and supplied in an ASCII format without conversion
- . register shall have a low flow indicator and face plate stamped with date of manufacturer
- . all registers must be removable without disassembling the meter
- . similar size and type of registers shall be interchangeable
- . measurement as specified
- . colour coded wire terminals shall be provided for connection of a three conductor cable and protected by a cover assembly

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- . meter and encoder register shall be guaranteed to meet AWWA New Meter Accuracy Standards for a period of five years from the date of purchase
- Remote receptacle assembly shall comply with AWWA C707 Section 3.4.
- The remote receptacle assembly shall be sturdy, tamper proof construction and have a “button type” design. The assembly shall be compatible with the manufacturer’s interrogation unit.

B. Approved Models

- | | |
|---------------------------|--|
| 1. Badger | ADE Sensus Protocol |
| 2. Carlon | |
| 3. Elster/AMCO (ABB-Kent) | |
| 4. Master Meter Inc. | Sonata
Acculinx
eLINX
Octave Ultrasonic |
| 5. Neptune | T-10 Pro Read |
| 6. Sensus | SR11 |

Part 23 AIR COMPRESSORS

A. Standards

- units to be CSA International approved, for supply of oil free air
- twin compressor units, cast iron, each of the two compressors to be single activating reciprocating-type with non-lubricated cylinders
- unitized piston and cross head not to overlap in travel
- oil from cross head lubrication to be prevented from reaching compression cylinders
- valves to be readily accessible
- con rods to be solid ends, non-adjustable type
- intercoolers to be finned multi tube copper construction
- compressors to unload automatically when unit stops, with unloader to be sealed in the crank case
- complete with interconnecting piping between compressors and receiver
- design of unit to permit one compressor to operate while second unit is serviced
- pressure regulation equipment to control automatically pressure in the single ASME receiver tank

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- complete with control panel to permit automatic cycling of the two compressors, with “hand-off-automatic” control to override the alternator
- running gear to be splash type with dippers to be integral with con rods
- receiver to have pressure gauge reading in kPa, drain valve, service air line gate valve and safety relief valve
- motors to be NEMA frame squirrel cage induction type with drip-proof enclosure
- voltage, phase, cycles, compressor output and tank capacity to be as specified

B. **Approved Models**

1. DeVilbiss
2. Ingersoll-Rand Twin Type 30

Part 24 SOLENOID VALVES

A. **Standards**

- to be two, three, or four way, general purpose (as required), pilot operated diaphragm type, with brass body, threaded joints, Teflon seat, open when energized with 1 \emptyset /60Hz/110-120 V current
- CSA International approved for air and water service

B. **Approved Models**

1. ASCO ITT General Controls S21
 Red Hat and Red Hat II
2. ITT Controls S21
3. Numatics L01 Series
4. Skinner 700 ries

Part 25 PRESSURE GAUGES

A. **Standards**

- round face 50 mm diameter or larger, with unbreakable crystal and black steel case
- brass or bronze internal parts
- threaded connections with brass snubber (pulsation damper) and shut off cock
- liquid filled (oil) (glycerin)

Effective Date: March 2022



- NSF 61 Wetted Parts

B. **Approved Models**

1. Ashcroft
2. Marshall Town Fig. 186
3. WIKA DW Series
4. Winters Model LF Series
 PFP-ZR Premium SS StabilizR

Part 26 BACKFLOW PREVENTION DEVICES

A. **Standards**

- in compliance with AWWA C511
- reduced pressure back flow prevention principle
- protection against back syphonage
- gate valves on inflow and outflow ends to service unit

B. **Approved Models**

1. Ames Series 400
2. Conbraco
3. Febco
4. Hersey (Beeco)
5. Watts
6. Wilkins (Zurn)

Part 27 PIPE SUPPORTS

A. **Standards**

- adjustable clevis - fabricated from carbon steel, black finish steel bolt to connect to clevis to beam for overhead piping suspension
- beam clamps - clevis pipe supports to I-beam connections shall consist of iron jaw and steel tie rod, nuts and washers with black finish
- ceiling flanges - malleable iron with flange to ceiling hardware consisting of Hilti Kwik bolts for concrete, or stainless steel bolts or screws for wood

Effective Date: March 2022



- support rods - beam to clamp connections shall have carbon steel threaded both ends
- saddle supports - adjustable, fabricated of cast iron
- metal framing – zinc coating required

B. Approved Models

1. ASC Engineered Solutions Adjustable Clevis Fig 260
 Riser Clamp Fig 261
 Beam Clamp Fig 218
 Ceiling Flanges Fig 128R
 Turnbuckle Fig 230
 Pipe Saddle Support Fig 258
 Pipe Stanchion Saddles Fig 259
 Support Rods Fig 140 and 253
2. Power-Strut Metal Framing – PS200
3. Unistrut Metal Framing – P1000

Part 28 PIPE RESTRAINTS

A. Standards

- one piece bell collar
- two piece split spigot collar with restraining threads
- ductile iron (ASTM A536, 65-45-12) collars and interconnecting T Bolts

B. Approved Models

1. CLOW Canada 300C
 360C
 390C
2. EBAA Iron Series 7500
 Series 6500
3. Sigma PV-LOK
4. Uniflange Series 1350

Part 29 AIR RELEASE VALVES

A. Standards

Effective Date: March 2022



- steel or cast iron body and cover, with threaded inlet
- stainless steel trim and float
- inlet and outlet size as specified

B. Approved Models

1. Apco Nos. 143C thru 151C (Model 400 for sewage)
2. A.R.I. D-090-P Underground Combination Air/Vacuum Valve
K060 (water service) fill (drain air release and APCO 140
and 150 Series
K010 Air Vacuum
S-020 Sewage (air release only)
D-020, D-025, D-023 combination for sewage service
3. Bermad Model C70 combination air/vacuum
4. Cla-Val Series 361-368-CAV
Series 35 and 36 WW for sewage
5. Crispin Model PL10, 10A, 20 and 20A UL Series
SL and S Series for sewage
C Series for Combination Air and Vacuum Valves
6. Val-Matic 200 Series and 200C Series (combination)
140 Series

Part 30 RESIDENTIAL FLOW CONTROL

A. Standards

- stainless steel with threaded inlet and outlet
- flow rate 14 or 23 litres per minute

B. Approved Models

1. Dole Model 4GC (3.33 IGPM)
Model 10GX (8.33 IGPM Nos. 143C thru 151C
Model 400 for sewage
2. Flowmatic CD900
3. Maric Model FFBP6-50

Effective Date: March 2022



Part 31 RESIDENTIAL PRESSURE REDUCING VALVES

A. Standards

- 19 mm diameter
- replaceable cartridge with spring (adjustable range 170 - 515 kPa)
- minimum inlet pressure up to 1035 kPa

B. Approved Models

- | | |
|-------------------|--------------------|
| 1. Apollo | 36ELF |
| 2. A.Y. MacDonald | |
| 3. Watts | U5B Bronze
7000 |
| 4. Wilkins/Zurn | No. 70 |

Effective Date: March 2022



CONCRETE WORKS

Part 1 AIR ENTRAINMENT AGENT ADMIXTURES

A. Standards

- shall meet the requirements of the current CSA Standard CAN A 266, 1-M

B. Approved Products

1. Master Builders MV-VR
2. W.R. Grace and Co Dara Vair 1400

Part 2 WATER REDUCING AGENT ADMIXTURES

A. Standards

- shall meet the requirements of the current CSA A 226.2-M Chemical Admixtures for Concrete Type WN and/or the current ASTM C 494, Type A

B. Approved Products

1. Master Builders Pozzolith 300N (ASTM Type A)
2. W.R. Grace and Co 9WRDA (CSA Type WN, ASTM Type A)

Part 3 ACCELERATING AND SET RETARDING ADMIXTURES

A. Standards

- subject to approval of the Engineer
- may be used in either cold or hot weather
- shall be in accordance with CAN-A266.2-M chemical admixtures for concrete

B. Approved Products

1. Fritz-Pak Standard delayed set Y Mini-Delayed Set
2. Sika Rugasol-S, Horizontal Surface retardant
3. W.R. Grace and Co Daratard (CSA Type WR, ASTM Types B and D)

Effective Date: March 2022



Part 4 WATER STOP

A. Standards

- shall meet the requirements of the current Hydro Electric Commission of Ontario Specification M-264

B. Approved Products

- | | |
|--------------------|------------------|
| 1. Green Streak | PVC and Neoprene |
| 2. Unicon Concrete | Durajoint - PVC |
| 3. W.R. Meadows | PVC Waterstops |

Part 5 EXPANSION JOINT FILLERS

A. Standards

- shall be non-extruding and resilient
- shall meet the requirements of ASTM D1752 (non-bituminous)

B. Approved Products

- | | |
|-----------------|-------------------------------|
| 1. Sika | SikaSwell S-2 |
| 2. W.R. Meadows | Sealtight, grey sponge rubber |

Part 6 JOINT SEALERS FOR CONCRETE

A. Standards

- shall meet the requirements of the current CAN/CGSB 19.13-M87 (Chemical Curing Type)

B. Approved Products

- | | |
|-----------------|---|
| 1. Sika | Sikaflex 11FC Brock White
Sikaflex 1-a Brock White |
| 2. Vulkem | One part Urethane |
| 3. W.R. Meadows | CS 309 |

Effective Date: March 2022



Part 7 CURING COMPOUNDS

A. Standards

- shall meet the requirements of the current CGSB Specification 90-GP-1A and/or ASTM C309

B. Approved Products

- | | |
|-----------------|----------------------------|
| 1. Sika | Floseal WB cure and sealer |
| 2. W.R. Meadows | 1100 clear series |
| | 1200 white series |
| | Med-Cure cure and hardener |

Part 8 EPOXY ADHESIVES

A. Standards

B. Approved Products

- | | |
|-----------------|----------------------------------|
| 1. Chemrex | Epoxy Adhesive 24LPL J.C. NSF 61 |
| 2. Sika | Sikadur 32 Hi-Mod Brock White |
| 3. W.R. Meadows | Rezi-Weld 1000 state J.C. NSF 61 |

Part 9 NON-SHRINK GROUT

A. Standards

- certified ANSI/NSF 61

B. Approved Products

- | | |
|------------|---------------------------|
| 1. Chemrex | Emaco S88 Ci Brock White |
| 2. Sika | Sikagrout 212 Brock White |

Effective Date: March 2022



Part 10 WATERPROOFING FOR INTERIORS OF RESERVOIRS

A. Standards

- shall be certified NSF 61

B. Approved Products

- | | |
|----------------------------|--|
| 1. Krystol | Kim Waterproofing Admixture for Concrete |
| 2. Penta | Permaquick Crystalline |
| 3. StonCor | Vandex SUPER Crystalline Waterproofing Coating to NSF 61 |
| 4. Thoro Consumer Products | ThoroSeal c/w bonding agent |
| 5. Xypex | c/w approved bonding agent |

Part 11 DAMPROOFING FOR CONCRETE WALLS BELOW GRADE

A. Standards

- shall be asphalt compound
- shall meet the requirements of the current CGSB 37-GP-2B, Emulsified Asphalt Compounds or CGSB 37-GP-6C, Asphalt Cut-Back

B. Approved Products

- | | |
|-----------------|---------------------------|
| 1. Bakor | 710-11 |
| 2. Websen | Insul-mastic Emulsion 710 |
| 3. W.R. Meadows | Sealmastic – Emulsion |

Effective Date: March 2022



ELECTRICAL

Part 1 MOTOR CONTROL

A. Standards

- all motor controls and starters shall be of the same manufacturer

B. Approved Products

1. Allen Bradley
2. Schneider Electric (Square D. Telmecanique)

Part 2 PUSHBUTTON STATIONS

A. Standards

- shall be flush or surface type

B. Approved Products

1. Allen Bradley
2. Schneider Electric (Square D. Telmecanique)

Part 3 TIME SWITCHES

A. Standards

B. Approved Products

1. Allan Bradley
2. Omron Electronic
3. Tork Mechanical
4. Schneider Electric (Telmecanique)

Effective Date: March 2022



Part 4 CIRCUIT BREAKERS/PANELBOARDS

A. Standards

B. Approved Products

1. Eaton Electrical (Cutler Hammer)
2. Schneider (Square D, Federal Pioneer)

Part 5 LIGHTING FIXTURES

A. Standards

1. Fluorescent:
 - minimum 20,000 hours rated average life
 - 3000 Lumens (32 watt) on T8
 - (54 watt) on T5
2. Ballasts
3. Outdoor High Pressure Sodium/Metal Halide

B. Approved Products

- | | |
|------------|-----------------|
| 1. Canlyte | Cooper Lighting |
| | GVA |
| 2. Osram | Sylvania |
| | Advance |
| | Sola (Phillips) |

Effective Date: March 2022