



THE MANITOBA WATER SERVICES BOARD

LISTING OF APPROVED PRODUCTS

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. Unless otherwise specified, all products listed herein shall be suitable for 1000 kPa cold water service.



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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 counterclockwise 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.
- stainless steel nuts and bolts below groundline (316).
- 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. Canada Valve B-50-B-24 (Darling)
2. Canada Valve “Century”
3. Premier, manufactured by Clow
4. Clow Brigadier M67
5. Mueller “Modern Centurion” and “Super Centurion”



PART 2 **GATE VALVES (in-ground type)**

A. **Standards size 50 mm (2") to 300 mm (12")**

- conform to AWWA C509 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 body, type 316 stainless steel trim, nuts and bolts. Internal and external epoxy coated to AWWA 550 (latest revision). Counterclockwise 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 (as per AWWA C509).
- stuffing boxes shall be O-ring sealed.
- valves shall allow for full size cutters during tapping operations.

B. **Approved Models**

1. Mueller Resilient Wedge Gate Valve (AWWA C509) AT2360 Series
2. Clow Resilient Wedge Valve (AWWA C509) F6102 (Flanged)
3. American AVK Co. Resilient Wedge Gate Valve (AWWA C509) (also including HDPE Stub ends)
4. Clow Resilient Wedge Valve c/w polyethylene pipe ends (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 over pipe (or as required in specs), with bituminous coating on all cast iron parts (AWWA C151, Sec. 51-7-3).
- PVC Schedule 40 5" diameter and PVC Schedule 80 CSA B137.3 Valve Box Bottom lower section (minimum 150 mm inside diameter) with flared bell for valve bonnet.
- the 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. Titan Type “E”
2. W.D. 82 (plastic bottom boot) and W.D. 82 PI
3. Mueller MVB Composite Valve Box MVB 070C, 090C, 110C and 130C.

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. Robar Type 304 Stainless Steel Nos. 5616 single section and 5626 (two piece)
2. Mueller 510 and 520 Series Stainless Steel
3. Romac - Clamp Style 304 Stainless Steel Models SS1 and SS2
4. Ford All Stainless Steel Repair Clamps FS1 and FS2
5. Cascade Style CR1, CR2 and CR3 Type 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. Robar “Cast Coupling: (1406) and (1506) with 9620 stainless steel inserts
2. Smith-Blair “Model 461 and 462 Quantum (CP)
3. Romac Model XR 501 Cast Coupling
4. Ford FC-1 and FC-2A (for PVC to AC transition). FC-1 and FC-2A to have ESH designation
5. Viking Johnson / Mueller “Maxi-Fit or Mega-Fit” (c/w all stainless steel nuts, bolts and washers)
6. Ford SC2W
7. Robar Vantage 1596
8. EBAA Iron Inc. Mega Coupling Series 3800 (Restrained Coupling) c/w stainless steel bolts
9. HYMAX Coupling
10. Romac Alpha Coupling (NSF 61)

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



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 "Type FB1100" and "Type F1000"
3. Ford "Type FB600" and "Type FB1000" (ball style)
4. Mueller "A-220" and "H-15008" groundkey (19 mm and 25 mm)
5. Mueller ball type "B-25000" or "B-25008" (25 mm, 38 mm and 50 mm)
6. Mueller "H15013" Oriseal Corp Stop (38 mm and 50 mm)
7. 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.

B1. Approved Models (Curb Stops)

1. Cambridge Brass Model 202 (ball style) CTS, and 6100-44 Series (ball) IPS
2. Ford "B77-666" (non-drain), "B77-777" (non-drain), "B11-777" (non-drain) and "B11-555" (non-drain)



3. Mueller "H-15214" and "H-15219" (draining) Oriseal Mark II, "H-15209" (non-drain), "H-15204 (non-drain) and Mueller "H10283" (non-drain)
4. Mueller "A617" and "H15217" Inverted Key 19 mm & 25 mm only, Mueller A616 (non-drain) 19 mm & 25 mm
5. Mueller "B25209 and "B25204" Ball Valve
6. A.Y. McDonald MFG 6100 Flare and Compression and 6101 F.P.T. Ball Valve
7. Omega Couplings & Flange Adapters

B2. Approved Models (Boxes)

1. Mueller "A726" and "A728" & "A-718" (19 mm and 25 mm or 32 mm) and "A-573" (38 mm and 50 mm)
2. WDVb Dwg. No. VB-19 PB and VB-31 PB with polymer moulded plastic boot
3. Titan SSB1 Small Polymer Boot and SSB2 Large PVC Boot
4. WDVb Valve Box SB20C (Polymer Boot and Galvanized Riser)
5. Mueller "A719" 600 mm upper section, short base for 19 mm and 25 mm curb stops, and "A619" 600 mm upper section, short base for 38 mm and 50 mm curb stops
6. 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 Screw

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. Royal Flex-Lox Series Pressure Pipe (bell & spigot)
2. Rehau, Aqualoc Series Pipe (bell & spigot)
3. IPEX Series Pressure Pipe (bell & spigot)
4. Certainteed Series PVC Pipe (bell & spigot)
5. Northern Pipe Products PVC Series Pipe (bell & spigot)
6. Diamond Plastics Series Pipe (bell & spigot)



PART 10 PRESSURE PIPE POLYVINYL CHLORIDE (CLASS)

A. Standard

- AWWA C900, Class 150 (water), Class 100 (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

1. IPEX Blue Brute (AWWA C900) and IPEX Centurion (AWWA C905) large diameter
2. Diamond Plastics (AWWA C900) Pipe
3. Certainteed (AWWA C900) PVC Pipe
4. Royal Flex Lox (AWWA C900) bell & spigot and (AWWA C905) large diameter pressure pipe
5. Northern Pipe Products
6. Diamond C900

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:

$$t = \frac{P \cdot (OD)}{2S + P}$$

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 PE3608 or PE4710
- high density polyethylene pipe identification shall be placed on each length of pipe 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. "Sclair Pipe" (KWH Pipe Canada Ltd.) HDPE and LDPE
2. Performance Pipe (Chevron) Phillips "Driscopipe", Driscoplex HDPE
3. Polytubes Inc. high density polyethylene pipe
4. Global Poly Systems Inc. HDPE
5. WL Plastics HDPE
6. IPEX
7. International Pipe Inc. (50 mm ø to 150 mm ø)
8. Dura Line Potable Water HDPE Pipe

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 recommended by the pipe manufacturer either type 304SS clamps and nylon insert or B-62 bronze insert and Type 304SS clamp combinations
4. 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
 5. 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. Wolverine
2. IPEX, kWh Polytubes, Performance Pipe (Drisco Pipe)
3. IPEX, Polytubes, kWh Geopipe (CSA)
4. KITEC (IPEX)
5. Rehau (PEX) Municipex

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.
- 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. Terminal City AWWA C110 complete with all stainless steel nuts, bolts, and washers (when flanged) otherwise ends to be ringtite or tyton
2. 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
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. 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)
5. Performance (Phillips Drisco) HDPE pipe fittings, injection moulded 19 mm to 300 mm, fabricated 300 mm and larger
6. KWH Sclairpipe HDPE fittings, injection moulded and fabricated 50 mm and larger in plain end and 38 mm to 100 mm in socket fusion
7. Rahn plastics fittings, injection moulded 50 mm and larger
8. Central plastics fittings
9. Electrofusion Central Plastics "Friatec"
10. Elofit by Nupi
11. Specified Fittings Inc.

PART 15 SERVICE PIPE FITTINGS

A. Standards

1. High Density Polyethylene Pipe c/w stainless steel inserts
 - 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 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. Ford, Mueller, Cambridge Brass, A.Y. McDonald
2. Boshart Ind. (Brass), Queensway Plastic (nylon)
3. Ford, Mueller, Cambridge Brass, A.Y. McDonald
4. Mueller, Cambridge Brass
5. Mueller, Ford, A.Y. McDonald, Cambridge Brass

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

Pipe

1. Royal Flex-Lox "Saniflex"
2. Rehau "Duraloc"
3. IPEX "Ring Tite Gasket Sewer Pipe"
4. Royal Seal; PVC DR 35
5. Northern Pipe PVC SDR 35
6. Diamond PVC SDR35

Fittings

1. GPK (injection moulded or fabricated and FRP reinforced)
2. Harco (injection moulded or fabricated and FRP reinforced)
3. IPEX Gasketed 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 200 mm thru 600 mm diameter
2. Rehau - Raurib sizes 200 mm thru 600 mm diameter
3. Royal (Kor Flo) (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

1. kWH – Weholite
2. Armttec Big-O POLYTITE
3. Boss 2000



PART 19 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.

B. Approved Makes

1. Inland Pipe
2. LaFarge Canada Inc.

PART 20 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 aluminum 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.

B. Approved Makes

1. Inland Pipe
2. LaFarge Canada Inc.



PART 21 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.

B. Approved Makes

1. Titan Foundry TF101M
2. WD Valve Boxes Ltd. Model WD50F (City of Winnipeg Spec. Std. Dwg SD-104A)

PART 22 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. Shaw “Yellowjacket / ”Insul-8” / ”Canusa”
2. Urecon U.I.P. System
3. Thermal Pipe Systems Inc.

PART 23 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
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. Big “O” (Boss 2000)
2. Weholite (KWH Pipe)
3. Solerno (Flo Max)

PART 24 **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. Big ‘O’ Drainage Tubing with filter sock
2. IPEX PVC Perforated c/w filter sock



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. Adaptor Flanges - “Uni-Flange”
2. Grooved and Shouldered Joint - Victaulic Style 77 and Gruvlok
3. Clow Series 40 and Series 90 (epoxy coated)
4. Romac (field flange) for ductile ip sizes

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. Stelco
2. Mittel Canada Inc.
3. Bentler

PART 3 IRON PIPE AND FITTINGS

A. Standards

- AWWA C110
- AWWA C115



B. **Approved Makes**

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

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. Rehau
2. IPEX/Spears
3. Royal

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**

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



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 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 300 mm 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. Kitz
2. Keystone resilient seat
3. CLOW/M&H
4. Pratt Ground Hog
5. Mueller Line Seal III
6. Apollo
7. Jamesbury

B2. Approved Large Size Valves Up To 300 mm Ø

1. Keystone Fig. 221 wafer and Fig. 222-786 lug
2. Crane Regent 50-B4E-AG
3. Crane Centerline 200 Series
4. Pratt, Wafer
5. Mueller Wafer and Lug Series
6. Bray Series 30/31
7. Dezurik Fig. 632
8. CLOW/M&H
9. Pratt



10. Mueller Line Seal (wafer)
11. KVC – complete with stainless steel disc
12. Sure Flow Equipment SF
13. Corix Industries Ltd. “Challenger”
14. Kitz DJ Series (M.A. Stewart)

B3. Valves Greater Than 300 mmØ

1. Val-matic Series 2000

B4. Approved Actuators

1. Tyco/Keystone Morin, F79U Pneumatic and Keystone EPI₂ (electric)
2. Regler WM Series
3. Kitz Model B and F Series
4. Bray Series 90/91 and Series 70 electric
5. Automax (Positioner and Limit Switch boxes)
6. Master gear (AWWA Submersible)
7. Pratt
8. Mueller
9. Apollo CompacTorque pneumatic and AE electric (MA Stewart)
10. Mas/Max – Air pneumatic and electro-hydraulic actuators (MA Stewart)
11. Limitorque
12. Rotork
13. Metso/Jamesbury

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 seal and seat; hand operating lever.

B. Approved Models

1. Conbraco “Apollo”
2. Crane Capri 9302/9322
3. Kitz 68, 58, 59, & 69
4. Aqua 313 or 314
5. Toyo 5044A/5049A (Red & White)
6. Anvil Mueller Model 171N-172N
7. A.Y. MacDonald (Part 2032T)



8. Keywin “Fast Ball Valve”
9. Watts Model B-6000
10. Milwaukee BA-100
11. Flowtec (stainless steel body)
12. MA Stewart B3& B4
13. KVC
14. Cambridge Brass B11 0827NL
15. Cambridge Brass 210 NL

PART 8 **BALL VALVES (PVC)**

A. **Standards**

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

B. **Approved Models**

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

PART 9 **GATE VALVES**

A. **Standards**

- i) 50 mm and smaller - bronze body, rising stem, solid wedge disc, fully guided disc travel screwed bonnet, open rim multi-rib handwheel
- ii) 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**

- i)
 1. Kitz 24 & 44 (Red and White)
 2. Crane No. 428
 3. Jenkins Fig. 810
 4. Canada Valve 520 S and Y
 5. Toyo 293



6. Hammond Part 606A
7. A.Y. MacDonald Model 2035T (non rising)
8. Nibco TE111
- ii)
 1. Kitz 72
 2. Crane No. 465
 3. Jenkins Fig. 454
 4. Toyo 421A (rising stem)
 5. Hammond
 6. Newco Fig. 12F-1B7
 7. Nibco FE 617-0
 8. CLOW - Flanged Resilient Wedge Gate Valve
 9. Newco 12F1B7

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. Kennedy Figure 602
3. Trueline Knifegate Valve
4. ORB Series 10 (resilient seat)
5. Flow Control Components (FCC) Fig. 83B (metal seat) and 84B (resilient seat)
6. Mueller No. GR 316 (Resilient Seat) and Mueller GM 316 (Metal Seat)
7. SF KG150 (Metal or Resilient Seat)
8. Red Valve - complete with cast iron body 316 stainless steel gate
9. FCC Knife Gate Fig. 73 & 74, 83 and 84
10. Fabri C67

PART 11 GLOBE VALVES

A. Standards



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

B. Approved Models

1. Kitz 12 & 03
2. Crane No. 5
3. Toyo 220 & 212
4. Nibco Models T211Y, T235Y, T275, S211Y, S235Y
5. AY MacDonald 2017 and 2018

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

- i)
 1. Crane No. 41
 2. Toyo 236 & 237
 4. Febco Model 810 (25 mm)
 5. Flow-matic Series 50 (Sewage)
 6. Nibco TE413B, SE413B
 7. Kitz 22 and 23
- ii)
 1. Crane No. 6439
 2. Apco
 3. Canada Valve 52SC Series



4. Mueller A2600 Series
 5. Flow-matic Series 408 (Sewage)
 6. Nibco FE 918B
 7. CLOW (Kennedy)
 8. Val-Matic
- iii)
1. Check-Rite Model 12 CBT
 2. MOYGRO 12A-16VW
 3. 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. Flomatic Globe and Wafer style
2. Mueller Figs. 101-AP and 105-AP
3. Anvil Fig. 400 (wafer) Series and Fig. 500 (globe) Series
4. Apco Series 300 and 600
5. Moygro W12A-16V
6. SureFlo Model CW-125/250 & CF 125
7. Mueller Model 71
8. Boshart Industries 17CV Bronze Inline Check Valve
9. Crispin Globe and Wafer Style
10. Mueller Stream Flo Series 94
11. Val-Matic 1400 & 1800 (Globe)
12. Claval 580 (Wafer)/581 (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. Hayward PVC Swing Check Valve
3. Ipex YB (12 mm to 100 mm) Ball 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

B. **Approved Models**

1. Wilkins (Zurn) Model 700
2. Apollo Valves Conbraco Series 4O-300 and 4N-300
3. Mueller H14242, H14243, H14244
4. Ford dual check cartridge style with stainless steel internal, HHS and HHA models (compression type)
5. AY MacDonald 11 x 3 FE Series

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



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
- 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. Singer Model 106-PR
2. Cla-Val Series 90G-01
3. Flowmatic Model C101 Pressure Reducing Valve
4. Wilkins 500 Series
5. OCV Series 127

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. Singer Model 106-RPS
2. Cla-Val Series 50G
3. Flowmatic Model C401 Pressure Relief Valve
4. OCV Series 108
5. Bermad

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

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



B2. Approved Models (large sizes)

1. Toyo 381A
2. Sure Flow
3. Kitz 80
4. Colton 125 YFI
5. Mueller Steam Specialities
6. Singer Model ZS Strainer

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

B. Approved Models

1. Schlumberger Neptune T-10
2. Neptune HP Turbine
3. Neptune Tru-Flo Compound
4. Elster/AMCO (ABB (Kent) C700BP, T3000, C-3000 (COMBO)
5. Sensus SR
6. Sensus W Turbo Meter
7. Endress & Hauser Pro Line promag Electromagnetic Meter
8. ABB FXM2000 Electromagnetic Meter
9. Badger Record All Disc (Turbo and Compound Series)
10. Siemens "SITRANS"
11. Krohne Enviromag 2000 Flowmeter (c/w Converter)



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
 - . 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. Neptune T-10 Pro Read
2. Sensus SR11
3. Elster/AMCO ABB (Kent)
4. Badger ADE Sensus Protocol

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
- 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. Ingersoll-Rand “Twin Type 30”
2. Devilbiss



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 Ø/60Hz/110-120 V current
- CSA International approved for air and water service

B. Approved Models

1. ITT General Controls S21
2. ASCO Series 8210, 8316 and 8344
3. ASCO Red Hat and Red Hat II
4. Skinner 700 Series
5. Numatics L01 Series

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) (glycern)

B. Approved Models

1. Marshall Town Fig. 186
2. Winter's Model LF Series
3. Ashcroft

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

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 - maleable iron with flange to ceiling hardware consisting of Hilti Kwik bolts for concrete, or stainless steel bolts or screws for wood
- 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. Adjustable Clevis - Anvil Fig. 260
2. Riser Clamp - Anvil Fig. 261
3. Beam Clamp - Anvil Fig. 218 and 228
4. Ceiling Flanges - Anvil Fig. 128 and 153
5. Support Rods - Anvil Fig. 140 and 253
6. Turnbucks - Anvil Fig. 230
7. Pipe Saddle Support - Anvil Fig. 264
8. Pipe Stanchion Saddles - Anvil Fig. 259
9. Unit Strut Metal Framing – P1000
10. Power Strut Metal Framing – PS200



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. Uni-flange Series 1350
2. CLOW 300, 350 and 360
3. Sigma / Nappco PV LOK
4. EBAA 7500 and 6500

PART 29 AIR RELEASE VALVES

A. Standards

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



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) or 10GX (8.33 IGPM)

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. Wilkin's/Zurn No. 70
2. Watts Model U5B Bronze and Watts 7000
3. Combraco 36100 Bronze and Combraco #70
4. AY MacDonald



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

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. W.R. Grace and Co. 9WRDA (CSA Type WN, ASTM Type A)
2. Master Builders (Pozzolith 300N (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. W.R. Grace and co. Daratard (CSA Type WR, ASTM Types B and D)
2. Fritz-Pak (Standard delayed set Y Mini-Delayed Set)
3. Sika (Rugasol-S, Horizontal Surface retardant)



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. Unicon Concrete (Durajoint – PVC)
2. Green Streak (PVC and Neoprene)
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. W.R. Meadows (Sealtight, grey sponge rubber)
2. Sika (SikaSwell S-2)

PART 6 JOINT SEALERS FOR CONCRETE

A. Standards

- shall meet the requirements of the current CGSB Specification 19-GP-3B (Chemical Curing Type)

B. Approved Products

1. Vulkem (one part Urethane)
2. Sika (Sikaflex 11FC) Brock White
3. Sika (Sikaflex 1-a) Brock White
4. W.R. Meadows (CS 309)



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 (Flo seal WB) cure and sealer
2. W.R. Meadows (1100 clear series, 1200 white series)
3. W.R. Meadows (Med-Cure) sure and hardener

PART 8 EPOXY ADHESIVES

A. Standards

B. Approved Products

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

PART 9 NON-SHRINK GROUT

A. Standards

- certified ANSI/NSF 61

B. Approved Products

1. Sika (Sikagrout 212) Brock White
2. ChemRex (Emaco S88 Ci) Brock White



PART 10 WATERPROOFING FOR INTERIORS OF RESERVOIRS

A. Standards

- shall be certified NSF 61

B. Approved Products

1. Thro Systems Products (Thoroseal c/w bonding agent)
2. Xypex Chemical Corporation (c/w approved bonding agent)
3. Krystol (Kim Waterproofing Admixture for Concrete)
4. Penta Permaquick Crystalline
5. StonCor Vandex SUPER Crystalline Waterproofing Coating

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. Websen (insul-mastic Emulsion 710)
2. W.R. Meadows (Sealmastic – Emulsion)
3. Bakor (710-11)



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 (Telemecanique, Square D)

PART 3 TIME SWITCHES

A. Standards

B. Approved Products

1. Omron Electronic
2. Tork Mechanical
3. Telemecanique
4. Allan Bradley



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)
3. Canlyte, Cooper Lighting