Delta

2026

PRESSURE REDUCING VALVE STATION SPECIFICATIONS

Pressure Reducing Valve Station Specifications

Pressure Reducing Valve (PRV) station design parameters should be reviewed and approved by the General Manager, Engineering before detailed design proceeds.

(a) Preliminary design parameters:

i. Design Flows:
- Peak hour
- Maximum day plus fire, continuous fire flow operation
- Location

ii. On-grade chamber details:
- Housing structure
- Access
- Controls
- Monitoring/SCADA
- Dewatering for sub-grade chamber
- HVAC

(b) Design Features:

- On grade or semi-subgrade
- Minimum chamber size
- External by-pass with close valve
- Parallel pressure reducing valves sized for peak hour and maximum day plus fire flows
- Small bore piping
- Isolation valves
- Air release valves
- H-style strainers upstream of each control valve
- Upstream and downstream pressure gauges
- Magnetic Flow meter
- Pipe break-in connections
- Interior pipework using Stainless steel
- Exterior pipework coated to AWWA standards and NSF 61
- Force air ventilation plus heat and light, if required
- Kiosk and electrical Panel
- RTU-controlled with connection to SCADA system:
    - Inlet and discharge pressure transmitters

- Flow meter transmitter
- Operator interface panel

(c) Mechanical Requirements:

All mechanical equipment and piping materials shall be new and of current manufacturer. All workmanship shall meet the standards of this bylaw and sub-standard work will be rejected.

All equipment shall be adequately protected from damage during handling and from dust, dampness or any other injurious substance during delivery to the site, while at the site and after construction. Any damage which may occur during handling, shipping, or installation shall be made good by the Contractor at his expense. Equipment stored in unheated or open areas on the site shall be covered and provided with thermostatically controlled heaters of sufficient size to keep temperature of the equipment above the dew point.

- Provided shall be pilot operated automatic pressure reducing control valves, each having a cast ductile iron globe pattern body with class 150 flanged ends, ductile iron cover, fusion bonded epoxy coating conforming to AWWA C550, 300 series stainless steel stem, spring, seat and retainer, plus a reduced port seat nominally one size smaller than the valve end openings. The lead valve shall be 80mm with a 50mm seat, the lag valve shall be 250mm with a 200mm seat.

- Valve piloting shall include lever operated isolating cocks at each body and cover tapping utilized, plus the pressure supply line, orifice type pilot restrictor, micrometer type opening speed control and position indictor with vent cock having 180 degree return tube.

- Each valve shall have an integral but redundant second diaphragm, and be fitted with a surge pilot to facilitate valve closing when required.

- All pilots shall be of tin bronze (minimum 8% SN, 87% Cu) or 300 series stainless steel with seamless copper tube and flared brass fittings. Singer 206-PR-SM, as available from Robins FloTech (1-888-882-0028), or approved equivalent.

- Duplex pilot supply strainer assembly provided as a complete assembly for wall mounting shall be two parallel 40mm Y-type strainers, each with 60 mesh 300

series stainless steel element and fitted blow-off cock. The assembly shall include inlet and outlet lever operating isolation cocks for each strainer, a differential pressure indicator gauge with lever operating cock and necessary air bleed cocks.

- Basket type inlet strainers provided on each PRV inlet line shall be a basket type strainer of cast iron, complete with 300 series stainless steel screen having 3mm perforations, a minimum open area of 40% and a total area of at least 4 times the port area. Minimum working pressure rating shall be at least 1380 kPa. Mueller #165 approved.

- Combination air release valves provided shall be combination automatic air release valves designed to relieve vacuum or air when line filling or draining, plus accumulated air when under pressure. Valves shall be suitable for potable water service and fitted with inlet isolating ball valve and outlet 180 degree return. Isolating valve and installation fittings shall be brass/bronze. Inlet shall be 50 mm NPT and the minimum working pressure 2070 kPa. Apco 145C, Crispin C20, ValMatic 202c/DI and ARI D062HF approved.

- Pressure gauge assemblies shall be provided with a 15mm lever operating isolating cock. Mounted atop this shall be a piston and rod type snubber, Ray Model 060B approved, to which a liquid-filled pressure gauge shall be installed. Gauge shall have a minimum 100mm dial, 15mm MNPT bottom connection of stainless steel or brass and a dual scale reading 0-2100 kPa. Isolating valve and installation fittings shall be brass/bronze and hex nipples, not close type, shall be utilized USG 656-6C, ENFM 7211, Wika 213.53, Winters LF, NuovaFima 18/3-A4 approved.

(d) Piping and Fittings

i. Non-threaded Steel Piping

- All non-threaded piping within the pumping station shall be fabricated from standard schedule ASTM A-53 black steel pipe.
- Branch outlets shall be fabricated utilizing FNPT Threadolet (Bonney Forge) connection fittings.

- Grooved ends of pipe shall be machine cut per Victaulic Standard Groove specifications. Grooved ends of 350mm or larger pipe shall be roll grooved, per Victaulic AGS specifications, and W-Series couplings and fittings shall be utilized.
- All grooved fittings, when available, shall be of ductile or malleable iron. Victaulic approved.

ii. Grooved end gaskets

- Grooved end gaskets shall be Grade 'E' Standard type.
- All grooved end gaskets shall be fully lubricated both inside and out with a manufacturer approved lubricant. Alternatively, approved dry lubricated gaskets may be utilized. VicPlus gasket system approved.
- The nuts of rigid type couplings shall be tightened to within manufacturer's specified torque range utilizing a torque wrench.

iii. Concentric Flowmeter Reducer Fittings

- Concentric flowmeter reducer fittings shall be of ductile iron with Class 150 flanged ends, and per ANSI/AWWA C110/A21.10 or C153/A21.53 dimensions.

iv. Flanged Assembly bolts

- Flange assembly bolts and all non-specialized bolts in the station shall be hexagon head machine bolts with hexagon nuts.
- Bolt material shall be galvanized steel 300 series stainless steel, installed with anti-seize lubricant.
- Threads shall conform to CSA B.1.1 coarse thread series, Class 2 fit.
- Bolt length shall be such that after the joints are made up the bolts shall protrude at least two threads past the nut, but not more than 12mm.

v. Conventional Flange Gaskets

- Conventional flange gaskets shall be die-cut and material shall consist of aramid fibers in a nitrile elastomeric binder with a minimum continuous temperature rating of 200 degree Celsius.
- Thickness shall be 1.6 mm (1/16") for flanges up to 600 mm, 3.2 mm (1/8") for larger flanges.

- Shall be Garlock Multi-Swell 3760 as available from Custom Gaskets (604-263-1426) or approved equivalent.

(e) Coatings

i. Water Immersed

- Inside of piping and fittings and Wall penetrations coating system shall be suitable for exposure in immersed environments at ambient temperatures. All surfaces should be assessed and treated in accordance with ISO 8504:1992. Oil or grease shall be removed.
- Immersed surfaces shall be surface prepared inside and out. If oxidation has occurred between blasting and application, the surface shall be reblasted to the specified visual standard. Surface defects revealed by the blast cleaning process, shall be ground, filled, or treated.
- Immediately following surface preparation, a prime coat of 2-component, tan or green colour high build epoxy, ANSI/NSF 61 certified and AWWA C210-03 compliant shall be applied by spray to a dry film thickness of 6.0-8.0 mils. International Interseal 670 HS coating material as available from CamCoat Industries or coating material as available from Cloverdale Paint approved.
- This shall be followed by a final coat of 2-component, contrasting white coloured epoxy ANSI/NSF 61 certified and AWWA C210-03 compliant, applied by spray to a dry film thickness of 6.0-8.0 mils. International Interseal 670 HS (EGA093) coating material as available from CamCoat Industries or coating material as available from Cloverdale Paint approved.
- Grooved end piping and fittings shall be internally coated for immersed service, as well as on the outer gasket sealing band between each pipe groove and the end of the pipe or fitting.
- Flexible rubber jacketed cables, liquid tight flexible conduit, nameplates, brass/copper, aluminum and stainless-steel components and valve internals shall not be painted.

ii. Dry Exterior Outside of piping and fittings

- Coating system shall be high durability (15+ year) rated and suitable for a classification C2 low corrosivity environment per ISO Standard 12944. All

surfaces should be assessed and treated in accordance with ISO 8504:1992. Oil or grease shall be removed.

- If oxidation has occurred between blasting and application, the surface shall be reblasted to the specified visual standard. Surface defects revealed by the blast cleaning process, shall be ground, filled, or treated.
- Immediately following surface preparation a prime coat of 2-component, primer grey coloured epoxy anti-corrosive primer shall be applied by spray to a dry film thickness of 2.5 -3.0 mils. International Intergard 251 coating material as available from CamCoat Industries, or ClovaPrime 21 as available from Cloverdale Paint approved.
- This shall be followed by a final coat of 2-component, “Safety Blue” coloured epoxy applied by spray to a dry film thickness of 2.5 – 3.0 mils. Total DFT system to be 5.0 – 6.0 mils. International Intergard 740 coating material as available from CamCoat Industries, or ClovaCost 833 Series available from Cloverdale Paint approved.
- Flexible rubber jacketed cables, liquid tight flexible conduit, nameplates, brass/copper, aluminum and stainless steel components shall not be painted.

(f) Inlet Line Check Valve

- Check valve body shall be globe style ductile iron with Class 150 flanged ends and double bearing guided shaft.
- Trim shall be lead-free bronze with stainless steel spring.
- Minimum 1725 kPa (250 psi) working pressure rating shall be provided.
- Shall be ValMatic Model 180X.

(g) Shop Drawings

- One (1) copy of drawings illustrating external dimensions and major structural details for the automatic pressure reducing control valves, fittings, piping and all associated equipment shall be submitted to the City for review.
- One (1) copy of a bill of material listing the significant items of mechanical equipment proposed shall be provided. The materials used and specifications to which they comply in the principal parts of the chamber, pumps, valves, fittings, and piping.

(h) Record Drawings

- Record drawings with one (1) complete bound set of typewritten or printed instructions, covering the proper method of operating and maintaining the equipment and systems shall be submitted upon completion of the PRV station.
- Included within the manual shall be a spare parts list for each item. Also included shall be manufacturer original printed operation and maintenance manuals on all pumps, valves, and equipment. The manual shall also include all finalized shop drawings in 280mm x 430mm format.
- Binders shall be easily opened, and reasonable space shall be available for the inclusion of design criteria and background information by the Consulting Engineer.

In addition, a digital Portable Document Format (PDF) copy of the manual shall be submitted. Digital record drawings are to be submitted in a format compatible with the City's drafting software (i.e. AutoCAD) as well as PDF format.