

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Division 01 – General Requirements.
- .2 Section 07 84 00 – Firestopping.
- .3 Section 23 08 02 - Cleaning and Start-up of Mechanical Piping Systems.

**1.2 REFERENCES**

- .1 Canadian General Standards Board (CGSB):
  - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Division 01 – General Requirements.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to approved metal recycling facility.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 CONNECTIONS TO EQUIPMENT**

- .1 In accordance with manufacturer's instructions unless otherwise indicated.
- .2 Use valves and either unions or flanges for isolation and ease of maintenance and assembly.
- .3 Use double swing joints when equipment mounted on vibration isolation and when piping subject to movement.

**3.2 CLEARANCES**

- .1 Provide clearance around systems, equipment and components for observation of operation, inspection, servicing, maintenance and as recommended by manufacturer.

- .2 Provide space for disassembly, removal of equipment and components as recommended by manufacturer or as indicated (whichever is greater) without interrupting operation of other system, equipment and components.

### **3.3 DRAINS**

- .1 Install piping with grade in direction of flow except as indicated.
- .2 Install drain valve at low points in piping systems, at equipment and at section isolating valves.
- .3 Pipe each drain valve discharge separately to above floor drain. Discharge to be visible.
- .4 Drain valves: NPS 3/4 ball valves unless indicated otherwise, with hose end male thread, cap and chain.

### **3.4 AIR VENTS**

- .1 Install automatic air vents at high points in piping systems.
- .2 Install isolating valve at each automatic air valve.
- .3 Install drain piping to approved location and terminate where discharge is visible.

### **3.5 DIELECTRIC COUPLINGS**

- .1 General: Compatible with system, to suit pressure rating of system.
- .2 Locations: Where dissimilar metals are joined.
- .3 NPS 2 and under: isolating unions or bronze valves.
- .4 Over NPS 2: Isolating flanges.

### **3.6 PIPEWORK INSTALLATION**

- .1 Screwed fittings jointed with Teflon tape.
- .2 Protect openings against entry of foreign material.
- .3 Install to isolate equipment and allow removal without interrupting operation of other equipment or systems.
- .4 Assemble piping using fittings manufactured to ANSI standards.
- .5 Saddle type branch fittings may be used on mains if branch line is no larger than half the size of main.
  - .1 Hole saw (or drill) and ream main to maintain full inside diameter of branch line prior to welding saddle.
- .6 Install exposed piping, equipment, rectangular cleanouts and similar items parallel or perpendicular to building lines.

- .7 Install concealed pipework to minimize furring space, maximize headroom and conserve space.
- .8 Slope piping, except where indicated, in direction of flow for positive drainage and venting.
- .9 Install, except where indicated, to permit separate thermal insulation of each pipe.
- .10 Group piping wherever possible and as indicated.
- .11 Ream pipes, remove scale and other foreign material before assembly.
- .12 Use eccentric reducers at pipe size changes to ensure positive drainage and venting.
- .13 Provide for thermal expansion as indicated.
- .14 Valves:
  - .1 Install in accessible locations.
  - .2 Remove interior parts before soldering.
  - .3 Install with stems above horizontal position unless otherwise indicated.
  - .4 Valves accessible for maintenance without removing adjacent piping.
  - .5 Install globe valves in bypass around control valves.
  - .6 Use ball or butterfly valves at branch take-offs for isolating purposes except where otherwise specified.
  - .7 Install butterfly valves between weld neck flanges to ensure full compression of liner.
  - .8 Use chain operators on valves NPS 2-1/2 and larger where installed more than 2400 mm above floor in Mechanical Rooms.
- .15 Check Valves:
  - .1 Install silent check valves on discharge of pumps and in vertical pipes with downward flow and elsewhere as indicated.
  - .2 Install swing check valves in horizontal lines on discharge of pumps and elsewhere as indicated.

### **3.7 SLEEVES**

- .1 General: Install where pipes pass through masonry, concrete structures, fire rated assemblies, and elsewhere as indicated.
- .2 Material: Schedule 40 black steel pipe.
- .3 Construction: Foundation walls and where sleeves extend above finished floors to have annular fins continuously welded on at mid-point.
- .4 Sizes: 6 mm minimum clearance between sleeve and un-insulated pipe or between sleeve and insulation.

- .5 Installation:
  - .1 Concrete, masonry walls and concrete floors on grade: Terminate flush with finished surface.
  - .2 Other floors: Terminate 25 mm above finished floor.
  - .3 Before installation, paint exposed exterior surfaces with heavy application of zinc-rich paint to CAN/CGSB-1.181.
- .6 Sealing:
  - .1 Foundation walls and below grade floors: Fire retardant, waterproof non-hardening mastic.
  - .2 Elsewhere: Provide space for firestopping. Maintain fire rating integrity.
  - .3 Sleeves installed for future use: Fill with lime plaster or other easily removable filler.
  - .4 Ensure no contact between copper pipe or tube and sleeve.

### **3.8 ESCUTCHEONS**

- .1 Install on pipes passing through walls, partitions, floors, and ceilings in finished areas.
- .2 Construction: One piece type with set screws. Chrome or nickel plated brass or type 302 stainless steel.
- .3 Sizes: Outside diameter to cover opening or sleeve. Inside diameter to fit around pipe or outside of insulation if so provided.

### **3.9 PREPARATION FOR FIRESTOPPING**

- .1 Material and installation within annular space between pipes, ducts, insulation and adjacent fire separation to Section 07 84 00 – Firestopping.
- .2 Un-insulated unheated pipes not subject to movement: No special preparation.
- .3 Un-insulated heated pipes subject to movement: Wrap with non-combustible smooth material to permit pipe movement without damaging firestopping material or installation.
- .4 Insulated pipes and ducts: Ensure integrity of insulation and vapour barriers.

### **3.10 FLUSHING OUT OF PIPING SYSTEMS**

- .1 In accordance with Section 23 08 02 - Cleaning and Start-up of Mechanical Piping Systems.
- .2 Before start-up, clean interior of piping systems in accordance with Division 01 – General Requirements supplemented as specified in relevant sections of Division 21, 22, 23 and 25.
- .3 Preparatory to acceptance, clean and refurbish equipment and leave in operating condition, including replacement of filters in piping systems.

**3.11 PRESSURE TESTING OF EQUIPMENT AND PIPEWORK**

- .1 Advise Engineer and/or Departmental Representative 48 hours' minimum prior to performance of pressure tests.
- .2 Pipework: Test as specified in relevant sections of Divisions 22 and 23.
- .3 Maintain specified test pressure without loss for 12 hours minimum unless specified for longer period of time in relevant sections of Division 22 and 23.
- .4 Prior to tests, isolate equipment and other parts which are not designed to withstand test pressure or media.
- .5 Conduct tests in presence of Engineer and/or Departmental Representative.
- .6 Pay costs for repairs or replacement, retesting, and making good. Engineer and/or Departmental Representative to determine whether repair or replacement is appropriate.
- .7 Insulate or conceal work only after approval and certification of tests by Engineer and/or Departmental Representative.

**3.12 EXISTING SYSTEMS**

- .1 Connect into existing piping systems at times approved by Engineer and/or Departmental Representative.
- .2 Request written approval 10 days minimum, prior to commencement of work.
- .3 Be responsible for damage to existing plant by this work.
- .4 Ensure daily clean-up of existing areas.

END OF SECTION