

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 23 05 29 - Pipe Hangers & Supports for HVAC Equipment & Piping
- .2 Section 23 05 53.01 - Mechanical Identification

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.
- .2 Canadian Standards Association (CSA International)
- .3 National Fire Code of Canada (NFCC 2005)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheets for piping and equipment and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements:
 - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

PART 2 PRODUCTS

2.1 MATERIAL

- .1 Paint: zinc-rich to CAN/CGSB-1.181.
 - .1 Primers, and Coating: in accordance with manufacturer's recommendations for surface conditions.
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- .2 Fire Stopping: in accordance with ULC assembly standards consistent with the penetration application.

PART 3 EXECUTION

3.1 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 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.

3.3 CLEARANCES

- .1 Provide clearance around systems, equipment and components for observation of operation, inspection, servicing, maintenance, and as recommended by manufacturer, National Fire Code of Canada and CSA B51.
- .2 Provide space for disassembly, removal of equipment and components as recommended by manufacturer without interrupting operation of other system, equipment and components.

3.4 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.
- .4 Discharge to be visible.
- .5 Drain valves: NPS 3/4 gate or globe valves unless indicated otherwise, with hose end male thread, cap and chain.

3.5 AIR VENTS

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

3.6 DIELECTRIC CONNECTIONS

- .1 General: compatible with system, to suit pressure rating of system.
- .2 Locations: where dissimilar metals are joined.
- .3 NPS 2 and under: isolating flanges or bronze valves no dielectric couplings permitted.
- .4 Over NPS 2: isolating flanges.

3.7 PIPEWORK INSTALLATION

- .1 Install pipework to CSA B51.
 - .2 The non-natural gas pipe works related to this project are deemed to be minor and generally related to making any required service tie-ins and or minor relocations to accommodate HVAC equipment installations as such the Contractor shall fully investigate existing piping systems and generally match these existing systems with respect to pipe class and material specifications when performing any pipe Works.
 - .3 Screwed fittings jointed with Teflon tape.
 - .4 Protect openings against entry of foreign material.
 - .5 Install to isolate equipment and allow removal without interrupting operation of other equipment or systems.
 - .6 Assemble piping using fittings manufactured to ANSI standards.
 - .7 Saddle type branch fittings may be used on mains if branch line is no larger than half size of main.
 - .1 Hole saw (or drill) and ream main to maintain full inside diameter of branch line prior to welding saddle.
 - .8 Install exposed piping, equipment, rectangular cleanouts and similar items parallel or perpendicular to building lines.
 - .9 Install concealed pipework to minimize furring space, maximize headroom, conserve space.
 - .10 Slope piping, except where indicated, in direction of flow for positive drainage and venting.
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- .11 Install, except where indicated, to permit separate thermal insulation of each pipe.
 - .12 Group piping wherever possible.
 - .13 Ream pipes, remove scale and other foreign material before assembly.
 - .14 Use eccentric reducers at pipe size changes to ensure positive drainage and venting.
 - .15 Provide for thermal expansion as indicated.
 - .16 Valves:
 - .1 Install in accessible locations.
 - .2 Remove interior parts before soldering.
 - .3 Install with stems above horizontal position unless 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 specified.
 - .7 Install butterfly valves between weld neck flanges to ensure full compression of liner.
 - .8 Install ball valves for glycol service.
 - .9 Use chain operators on valves NPS 2 1/2 and larger where installed more than 2400 mm above floor in Mechanical Rooms.
 - .17 Check Valves:
 - .1 Install silent check valves on discharge of pumps and in vertical pipes with downward flow and as indicated.
 - .2 Install swing check valves in horizontal lines on discharge of pumps and as indicated.

3.8 SLEEVES

- .1 General: install where pipes pass through masonry, concrete structures, fire rated assemblies, and as indicated.
 - .2 Material: schedule 40 black steel pipe, painted.
 - .3 Construction: use annular fins continuously welded at mid-point at foundation walls and where sleeves extend above finished floors.
 - .4 Sizes: 6 mm minimum clearance between sleeve and uninsulated pipe or between sleeve and insulation.
 - .5 Installation:
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- .1 Concrete, masonry walls, 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:
 - .3 Provide space for fire stopping.
 - .4 Maintain fire rating integrity.
 - .5 Sleeves installed for future use: fill with lime plaster or other easily removable filler.
 - .6 Ensure no contact between copper pipe or tube and sleeve.

3.9 ESCUTCHEONS

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

3.10 FIRE STOPPING

- .1 Install fire stopping within annular space between pipes, ducts, insulation and adjacent fire separation in accordance with ULC assembly instructions for the application.
- .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 fires topping material or installation.
- .4 Insulated pipes and ducts: ensure integrity of insulation and vapour barriers.

3.11 FLUSHING OUT OF PIPING SYSTEMS

- .1 Materials
 - .1 System Cleaner: Ferroquest FQ7103
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- .2 Closed System Corrosion Inhibitor: Corrshield NT4206 or MD4102
 - .3 Provide necessary MSDS, test kits and log books for testing inhibitor levels
 - .2 All systems must be chemically cleaned and flushed. This includes partial or complete filling for pressure testing.
 - .3 After all components of the piping system have been pressure tested and proven to be in full operational condition and leak free, flush entire system with fresh, clean make-up water to remove loose mill scale, sediment and construction debris
 - .4 Provide drain connections to drain system in one hour.
 - .5 After initial flushing has been completed, clean all strainer screens
 - .6 System pumps may be used for cleaning, provided that pumps are dismantled and inspected, worn parts repaired with new gaskets and seals installed. Submit used seals.
 - .7 Add cleaner to closed systems at concentration levels recommended by the Water Treatment Specialist.
 - .8 Before start-up, clean interior of piping systems in accordance with requirements of Section 01 74 00 - Cleaning and Waste Management supplemented as specified in relevant mechanical sections.
 - .9 Preparatory to acceptance, clean and refurbish equipment and leave in operating condition, including replacement of filters in piping systems.

3.12 PRESSURE TESTING OF EQUIPMENT AND PIPEWORK

- .1 Advise Contract Administrator 48 hours minimum prior to performance of pressure tests.
 - .2 Pipework: test as specified in relevant sections of heating, ventilating and air conditioning work.
 - .3 Maintain specified test pressure without loss for 4 hours minimum unless specified for longer period of time in relevant mechanical sections.
 - .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 Contract Administrator.
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- .6 Pay costs for repairs or replacement, retesting, and making good. Contract Administrator to determine whether repair or replacement is appropriate.
- .7 Insulate or conceal work only after approval and certification of tests by Contract Administrator.

3.13 EXISTING SYSTEMS

- .1 Connect into existing piping systems at times approved by Contract Administrator.
- .2 Request written approval by Contract Administrator 10 days minimum, prior to commencement of work.
- .3 Be responsible for damage to existing plant by this work.

3.14 CLEANING

- .1 Clean in accordance with Section 01 74 00 - Cleaning and Waste Management.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION
