

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 23 05 49.01 - Seismic Restraint Systems (SRS).

1.2 REFERENCES

- .1 Unless otherwise indicated, all the works must be done in accordance with the in force edition of the "Code de construction du Québec".
- .2 Furthermore, the works will be done in accordance with any other code or norm having jurisdiction, as per the latest edition, notably including, but not limited to:
 - .1 American Society for Testing and Materials International (ASTM).
 - .1 ASTM A125-1996(R2001), Specification for Steel Springs, Helical, Heat-Treated.
 - .2 ASTM A307-04, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM A563-04a, Specification for Carbon and Alloy Steel Nuts.
 - .2 Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS).
 - .1 MSS SP58-2002, Pipe Hangers and Supports - Materials, Design and Manufacture.
 - .2 ANSI/MSS SP69-2003, Pipe Hangers and Supports - Selection and Application.
 - .3 MSS SP89-2003, Pipe Hangers and Supports - Fabrication and Installation Practices.
 - .3 Underwriter's Laboratories of Canada (ULC).
 - .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

- .1 Submit documents and samples required.
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- .2 Submit shop drawings and product data for following items:
 - .1 Bases, hangers, and supports;
 - .2 Connections to equipment and structure;
 - .3 Structural assemblies.
- .3 Certificates:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .4 Instructions:
 - .1 Submit manufacturer's installation instructions.
- .5 Closeout Submittals.
 - .1 Provide maintenance data for engines, transmissions and guards, and attach them to the "Operating and Maintenance Manual".

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- .1 Design Requirements.
 - .1 Construct pipe hanger and support to manufacturer's recommendations using manufacturer's regular production components, parts, and assemblies.
 - .2 Base maximum load ratings on allowable stresses prescribed by MSS SP58 or ASME B31.1 Standard.
 - .3 Design hangers and supports to support piping, air ducts, systems and mechanical equipments under operating conditions allow free expansion and contraction of supported elements, to prevent excessive stress from being introduced into piping or connected equipments.
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- .4 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment in accordance with MSS SP58 Standard.
- .2 Performance Requirements.
 - .1 Design supports, platforms, catwalks, hangers, to withstand seismic events as specified Section 23 05 49.01 - Seismic Restraint Systems (SRS).

2.2 GENERAL

- .1 Fabricate hangers, supports, and sway braces in accordance with ANSI B31.1 and MSS SP58 Standards.
- .2 Use components for intended design purpose only. Do not use for rigging or erection purposes.

2.3 PIPE HANGERS

- .1 Finishes.
 - .1 Pipe hangers and supports: Galvanized after manufacture.
 - .2 Use electro-plating galvanizing process.
 - .3 Ensure steel hangers in contact with copper piping are copper plated epoxy coated.

2.4 EQUIPMENT ANCHOR BOLTS AND TEMPLATES

- .1 Provide templates to ensure accurate location of anchor bolts.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.
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3.2 INSTALLATION

- .1 Clamps on riser piping.
 - .1 Support independent of connected horizontal pipework using riser clamps and riser clamp lugs welded to riser.
 - .2 Bolt-tightening torques to industry standards.
 - .3 Steel pipes: Install below coupling or shear lugs welded to pipe.
 - .4 Cast iron pipes: Install below joint.
- .2 Anchorage components for hangers mounted on concrete structure.
 - .1 Attach elements (plates and stirrup) using at least four (4) concrete inserts, one at each corner.

3.3 SPACING BETWEEN SUPPORTS AND SUSPENSIONS

- .1 Follow the requirements of the Quebec Construction Code, Chapter III, Plumbing for plumbing piping network.
- .2 Install supports/suspension at each 1.5 m for NPS ½ or smaller copper piping
- .3 Install a support/suspension at a maximum of 300 mm from each elbow.
- .4 Install supports at base of vertical piping, at the high point of each floor.
- .5 In addition to the above required supports, install supports and suspensions on the straight lengths of the piping as described in the tables below:

HEATING, COOLING AND PLUMBING PIPING						
MAXIMUM SPACING FOR HORIZONTAL PIPING, IN METERS						
Ø PIPING (NPS)	Ø ROD mm	STEEL	COPPER	ASBESTOS CEMENT	ABS PVC	CPVC
Up to ½	10	2.1	1.5	---	0.9	0.8
¾	10	2.1	1.5	---	1.0	0.9
1	10	2.1	1.8	---	1.1	1.0
1¼	10	2.1	2.1	2.0	1.2	1.2
1½	10	2.7	2.4	2.0	1.3	1.3
2	10	3.0	2.4	2.0	1.5	1.4
2½	13	3.4	2.7	2.0	---	1.7

HEATING, COOLING AND PLUMBING PIPING						
MAXIMUM SPACING FOR HORIZONTAL PIPING, IN METERS						
Ø PIPING (NPS)	Ø ROD mm	STEEL	COPPER	ASBESTOS CEMENT	ABS PVC	CPVC
3	13	3.6	3.0	2.0	1.9	1.8

3.4 HANGER INSTALLATION

- .1 Install hanger so that rod is vertical under operating conditions.
- .2 Adjust hangers to equalize load.
- .3 Support from structural members. Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

3.5 HORIZONTAL MOVEMENT

- .1 Angularity of rod hanger resulting from horizontal movement of pipework from cold to hot position not to exceed 4° from vertical.
- .2 Where horizontal pipe movement is less than 13 mm, offset pipe hanger and support so that rod hanger is vertical in the hot position.

3.6 FINAL ADJUSTMENT

- .1 Adjust Hangers and Supports.
 - .1 Ensure that rod is vertical under operating conditions.
 - .2 Equalize loads.
- .2 Adjustable Clevis.
 - .1 Tighten hanger load nut securely to ensure proper hanger performance.
 - .2 Tighten upper nut after adjustment.
- .3 C-Clamps.
 - .1 Follow manufacturer's recommended written instructions and torque values when tightening C-clamps to bottom flange of beam.

.4 Beam Clamps.

- .1 Hammer jaw firmly against underside of beam.

3.7 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services.

- .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
- .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.8 CLEANING

- .1 Perform cleaning site.
- .1 Dispose of construction materials surplus, waste, tools, and equipment.

END OF SECTION
