

## **1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 21 05 01 – Common Work Results - Mechanical.
- .2 Section 23 05 05 – Installation of Pipework.

### **1.2 REFERENCES**

- .1 ASTM International:
  - .1 ASTM A125, Standard Specification for Steel Springs, Helical, Heat-Treated.
  - .2 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .3 ASTM A563, Standard Specification for Carbon and Alloy Steel Nuts.
- .2 Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS):
  - .1 MSS SP58, Pipe Hangers and Supports - Materials, Design and Manufacture.
  - .2 MSS SP69, Pipe Hangers and Supports - Selection and Application.
  - .3 MSS SP89, Pipe Hangers and Supports - Fabrication and Installation Practices.
- .3 Underwriter's Laboratories of Canada (ULC).

### **1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures and Section 21 05 01 – Common Work Results – Mechanical.

## **2 Products**

### **2.1 SYSTEM DESCRIPTION**

- .1 Design Requirements:
  - .1 Construct pipe hanger and support to manufacturer's recommendations utilizing manufacturer's regular production components, parts and assemblies.
  - .2 Base maximum load ratings on allowable stresses prescribed by ASME B31.1 and MSS SP58.
  - .3 Ensure that supports, guides, anchors do not transmit excessive quantities of heat to building structure.
  - .4 Design hangers and supports to support systems under conditions of operation, allow free expansion and contraction, prevent excessive stresses from being introduced into pipework or connected equipment.
  - .5 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment in accordance with MSS SP58.

## **2.2 GENERAL**

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

## **2.3 PIPE HANGERS**

- .1 All pipe hangers, swivel rings, clevis hangers, supports, threaded rod, nuts, bolts, plates, unistrut, etc. shall be stainless steel, suitable for potential damp and/or salt water environments.
- .2 Upper attachment to concrete:
  - .1 Concrete inserts: wedge shaped body with knockout protector plate UL listed FM approved to MSS SP69.
- .3 Stainless Steel (SS) hanger rods: threaded rod material to MSS SP58:
  - .1 Ensure that hanger rods are subject to tensile loading only.
  - .2 Provide linkages where lateral or axial movement of pipework is anticipated.
- .4 Adjustable clevis: material to MSS SP69 UL listed FM approved, clevis bolt with nipple spacer and vertical adjustment nuts above and below clevis.
- .5 Acceptable Materials: Anvil, Bibby, Grinnell, Hunt, Myatt.

## **3 Execution**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

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

### **3.2 INSTALLATION**

- .1 All pipes shall be hung securely from structure.
- .2 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 Clevis plates:
  - .1 Attach to concrete with four (4) minimum concrete inserts, one at each corner.
- .4 Use approved constant support type hangers where:
  - .1 Vertical movement of pipework is 13 mm or more,

- .2 Transfer of load to adjacent hangers or connected equipment is not permitted.
- .5 Use variable support spring hangers where:
  - .1 Transfer of load to adjacent piping or to connected equipment is not critical.
  - .2 Variation in supporting effect does not exceed 25% of total load.

### **3.3 HANGER SPACING (HORIZONTAL)**

- .1 At or adjacent to each elbow, both directions. Provide support within 300 mm of each elbow.
- .2 HDPE pipe: every 1200 mm.

### **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 degrees 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.

**END OF SECTION**