

SECTION 15060
SUPPORTS, ANCHORS AND PENETRATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. This section describes minimum requirements for supports, anchors and penetrations at ANC.

1.2 REFERENCES

- A. ASME B31.9 - Building Services Piping.
- B. MSS SP58 (Manufacturers Standardization Society) - Pipe Hangers and Supports - Materials, Design and Manufacture.
- C. MSS SP69 - Pipe Hangers and Supports - Selection and Application.
- D. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

1.3 DESCRIPTION

- A. This section applies to all piping specified in Division 15 on the project, except:
1. Fire protection piping, which shall be supported in accordance with the provisions of Section 15300, and
 2. Plumbing piping, where provisions of this section may conflict with the Plumbing Codes.
- B. Design Requirements
1. Select and apply all pipe hangers and supports per MSS SP69.
 2. Design support spacing so free span of piping does not exceed the amount indicated in MSS SP69.
 3. Design expansion compensation system to adequately protect piping and structure from thermal expansion and contraction forces.
- C. Performance Requirements
1. Support and anchor all mechanical equipment, piping and ductwork as required for life safety and protection of property during normal operation and during a seismic event. Anchors and supports shall comply with Section 15070.
 2. Provide loops, pipe offsets, and swing joints, or expansion joints where required or indicated.
 3. Hangers and supports shall allow free expansion and contraction of the piping, and prevent excessive stress resulting from transferred weight being introduced into the pipe, adjacent supports, or connected equipment.
 4. Pipes shall be capable of thermal expansion movement without disengagement of supports.
 5. Provide structural work and equipment required to control expansion and contraction of piping. Verify that anchors, guides, and expansion joints provided, adequately protect system.

6. Expansion Calculations:
 - a. Installation Temperature: 40 degrees F. (four degrees C).
 - b. Hot Water Heating: 210 degrees F. (99 degrees C).
 - c. Domestic Hot Water: 140 degrees F. (60 degrees C).
 - d. Safety Factor: 30 percent.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Design expansion compensating system under direct supervision of a Professional Engineer experienced in design of this work and licensed in the State of Alaska.

PART 2 PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

- A. General:
 1. All piping and support systems shall be malleable iron, steel or copper, designed and manufactured per MSS SP58 specifically for the piping material and weight application. Systems used for supporting piping outdoors shall be galvanized.
 2. All hangers shall be designed to securely lock using a mechanical fastener. Hangers and supports using gravity type locking are not acceptable.
 3. Manufacturer's pre-engineered support systems such as Unistrut, Super-Strut, B-Line, and K-Line may be used in accordance with manufacturers load limits.
 4. Ductwork: Refer to Section 15880 - Air Distribution
- B. Plumbing Piping:
 1. Conform to the Uniform Plumbing Code requirements.
- C. Hydronic Piping:
 1. Conform to ASME B31.9 and the International Mechanical Code.
- D. Refrigerant Piping:
 1. Conform to ASME B31.5.

PART 3 EXECUTION

3.1 EARTHQUAKE ANCHORAGE

- A. Refer to Section 15070, Mechanical Sound, Vibration, and Seismic Control.

3.2 INSTALLATION

- A. Flexible connectors: Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.

B. Inserts and Attachments

1. Make all attachments to structure.
2. Structural steel clamps shall engage both sides of member or shall have retaining clips or other approved positive engagement.
3. Use expansion type anchor bolts with precast or existing concrete including concrete masonry units within loading limits of the precast material.
4. Powder-driven studs shall not be used.
5. Plastic screw inserts and caulked lead inserts are prohibited, except for mounting instructions and control diagrams.

C. Pipe hangers and supports

1. Fabricate and install all pipe hangers and supports per MSS SP89 recommended practices and with manufacturer's instructions.

D. Penetrations: Coordinate with architectural and structural construction details. Provide compatible materials, fasteners, adhesives, sealants, and all other products required for proper installation of all mechanical penetrations.

E. Require flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

END OF SECTION