

SECTION 15140

HANGERS, SUPPORTS AND ANCHORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe and equipment hangers and supports.
- B. Equipment bases and supports.
- C. Sleeves and seals.
- D. Flashing and sealing equipment and pipe stacks.

1.2 RELATED SECTIONS

- A. Division 3 - Cast-In-Place Concrete: Equipment bases.
- B. Division 7 - Firestopping: Joint seals for piping and duct penetration of fire rated assemblies.
- C. Division 9 - Painting.
- D. Section 15250 - Mechanical Insulation.
- E. Section 15300 - Fire Protection.

1.3 REFERENCES

- A. ASME B31.9 - Building Services Piping
- B. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
- C. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
- D. MSS SP69 - Pipe Hangers and Supports - Selection and Application.
- E. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
- F. NFPA 13 - Installation of Sprinkler Systems.
- G. NFPA 14 - Installation of Standpipe and Hose Systems
- H. UL 203 - Pipe Hanger Equipment for Fire Protection Service

1.4 SUBMITTALS

- A. Submit under provisions of Division 1, Shop Drawings, Product Data and Samples.
- B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- C. Product Data: Provide manufacturers catalog data including load capacity.
- D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- E. Manufacturer's Installation Instructions: Indicate special procedures and assembly of components.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for support of plumbing, hydronic piping.
- B. Supports for Sprinkler Piping: In conformance with NFPA 13.
- C. Supports for Standpipes: In conformance with NFPA 14.
- D. SMACNA guidelines for seismic restraints of mechanical and plumbing systems, as approved by OSHPD.

PART 2 PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
 - 1. Elcen Metal Products Co.
 - 2. Fee & Mason Mfg Co.
 - 3. ITT Grinnell Corp.
 - 4. B-line Systems, Inc.
- B. Fire Protection Piping:
 - 1. Conform to NFPA 13.
 - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron, adjustable swivel, split ring.
 - 3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
 - 7. Vertical Support: Steel riser clamp.
 - 8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - DWV:
 - 1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69 and MSS SP89.
 - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron, adjustable swivel, split ring.
 - 3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
 - 7. Vertical Support: Steel riser clamp.

8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.2 ACCESSORIES

- A. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

2.3 FLASHING

- A. Metal Flashing: 26 gage galvanized steel.
- B. Metal Counterflashing: 22 gage galvanized steel.
- C. Lead Flashing:
 1. Water proofing: 5 lb/sq ft sheet lead

2.4 SLEEVES

- A. Sleeves for Pipes through Non-fire Rated Floors: 18 gage galvanized steel.
- B. Sleeves for Pipes through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage galvanized steel.
- C. Sleeves for Pipes through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.
- D. Sleeves for Round Ductwork: Galvanized steel.
- E. Sleeves for Rectangular Ductwork: Galvanized steel.
- F. Stuffing, Firestopping Insulation: Glass fiber type, non-combustible.
- G. Sealant: Acrylic.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.2 INSERTS

- A. Attach supporting rods or clips to expansion bolts drilled into the concrete, equal to Rawl saber tooth ICBO approved. Place bolts into the side of beam, joist or rib. No power driven device, ramset or low velocity stud shall be used.
- B. Attach supporting rods to beams with beam clamps. Beam clamps malleable iron, Grinnell Fig. 228 for loads to 540 lbs.; forged steel clamp, Grinnell Fig 292 for loads to 1,140 lbs.

3.3 PIPE HANGERS AND SUPPORTS

- A. Support horizontal piping as scheduled.
- B. Arrange hangers to prevent transmission of vibration from piping to building structure and allow for expansion and contraction in hangers and supports.

- C. Clearances for application of specified insulation without cutting pipeline covering or fitting covering in installation of pipe hangers and fittings shall be provided.
- D. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- E. Place hangers within 12 inches of each horizontal elbow.
- F. Use hangers with 1-1/2 inch minimum vertical adjustment.
- G. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- H. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- I. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- J. Support riser piping independently of connected horizontal piping.
- K. Provide copper plated hangers and supports for copper piping. Non-insulated copper or brass pipe or tubing shall be isolated from ferrous hangers or supports
- L. Design hangers for pipe movement without disengagement of supported pipe.
- M. All hangers, pipe supports, etc., that are exposed to the weather shall be made of hot-dip galvanized after fabrication galvanized steel. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- N. Where concealed piping may be supported from structural floor, furnish and install angle members to span joists or distribute load if additional members are required.
- O. Provide stainless steel clamps and thrust blocks on all dead ends, anchor and other points where separation may occur in underground mechanical joint piping.
- P. Hanger spacing:

Pipe Size	Rod Diameter	Brass, Steel, Wrought Iron Hanger Spacing	Copper Tubing Hanger Spacing
Up to 1-1/4"	3/8"	6'-0"	6'-0"
1-1/2" and 2"	3/8"	10'-0"	6'-0"
2-1/2" and 3"	1/2"	10'-0"	8'-0"
4" and 5"	5/8"	10'-0"	8'-0"
6"	3/4"	10'-0"	10'-0"
10" and 12"	7/8"	10'-0"	10'-0"
14" thru 24"	1"	10'-0"	10'-0"

- Q. Special piping material: As recommended by manufacturer.
- R. Support piping at each change of direction, at ends of branches, at base and at top of riser pipes and drops and wherever necessary to prevent sag, bending, or vibration, in addition to the above listed hanger spacing.
- S. Pipe restraints: Pipe restraints required for seismic forces shall be as detailed on the drawings. Contractor shall submit Shop Drawings showing location and calculations of restraints designed and signed by a registered Structural engineer before items are installed. Provide lateral and longitudinal sway bracing for all suspended piping as required.

3.4 EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of Concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment. Refer to Division 3.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.5 FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide curbs for mechanical roof installations 14 inches minimum high above roofing surface. Flash and counterflash with sheet metal; seal watertight. Attach counterflashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.
- C. Adjust storm collars tight to pipe with bolts; calk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.6 SLEEVES

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Extend sleeves through floors one inch above finished floor level. Calk sleeves.

END OF SECTION