

SECTION 15060

HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT

**PART 1 –GENERAL**

1.1 SUMMARY

- A. Section includes pipe and equipment supports, hangers, anchors, bases sleeves and the sealing of work to adjacent construction.

1.2 REFERENCES

- A. ASME B31.1 (American Society of Mechanical Engineers) - Power Piping
- B. ASME B31.5 (American Society of Mechanical Engineers) - Refrigeration Piping
- C. ASME B31.9 (American Society of Mechanical Engineers) - Building Services Piping
- D. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
- E. MSS SP58 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Materials, Design and Manufacturer.
- F. MSS SP69 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Selection and Application.
- G. MSS SP89 (Manufacturers Standardization Society of the Valve and Fittings Industry) - Pipe Hangers and Supports - Fabrication and Installation Practices.
- H. NFPA 13 (National Fire Protection Association) - Installation of Sprinkler Systems.
- I. NFPA 14 (National Fire Protection Association) - Installation of Standpipe and Hose Systems

1.3 SUBMITTALS

- A. Refer to Section 01330 - Submittal Procedures.
- B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- C. Product Data: Submit 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: Submit special procedures and assembly of components.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

#### 1.4 QUALITY ASSURANCE

- A. Perform work in accordance with applicable code for piping support and in conformance with NFPA 13 and 14 for support of sprinkler piping and standpipes.
- B. Maintain one copy of each document on site.

#### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

#### 1.6 PRE-INSTALLATION MEETING

- A. Section 01330 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

#### 1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

#### 1.8 WARRANTY

- A. Section 01770 - Execution Requirements: Product warranties and product bonds.
- B. Provide five year manufacturer warranty for pipe hangers and supports.

## **PART 2 –PRODUCTS**

### **2.1 PIPE HANGERS AND SUPPORTS**

#### **A. Manufacturers:**

1. Superstrut
2. Unistrut
3. Fee and Mason
4. B-Line
5. or equal

#### **B. Hydronic piping**

1. Conform to ASME B31.9.
2. Hangers for Pipe Sizes ½ to 1-1/2 inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
3. Hangers for Cold Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
5. Hangers for Hot Pipe Sizes 6 inches and Over: Adjustable steel yoke, cast iron roll, double hanger.
6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and Over: Steel channels with welded spacers and hanger rods, cast iron roll.
8. Wall Support for Pipe Sizes to 3 inches: Cast iron hooks.
9. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
10. Wall Support for Hot Pipe Sizes 6 inches and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.

11. Vertical Support: Steel riser clamp.
12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
13. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
14. Floor Support for Hot Pipe Sizes 6 inches and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
15. Copper Pipe Support: Copper-plated, carbon steel ring.

C. Steam and Steam Condensate Piping:

1. Conform to ASME B31.1.
2. Hangers for Pipe Sizes ½ to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
3. Hangers for Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
4. Hangers for Pipe Sizes 6 inches and Over: Adjustable steel yoke, cast iron roll double hangers
5. Multiple or Trapeze Hangers for Pipe Sizes to 4 inches: Steel channels with welded spacers and hanger rods.
6. Multiple or Trapeze Hangers for Pipe Sizes 6 inches and Over: Steel channels with welded spacers and hanger rods; cast-iron roll and stand.
7. Wall Support for Pipe Sizes to 3 inches: Cast iron hooks.
8. Wall Support for Pipe Sizes 4 to 5 inches: Welded steel bracket and wrought steel clamp.
9. Wall Support for Pipe Sizes 6 inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll.
10. Vertical Support: Steel riser clamp.
11. Floor Support for Pipe Sizes to 4 inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

12. Floor Support for Pipe Sizes 6 inches and Over: Adjustable cast iron roll and stand steel screws, and concrete pier or steel support.

13. Copper Pipe Support: Copper-plated carbon-steel ring.

D. Refrigerant Piping:

1. Conform to ASME B31.5.

2. Hangers for Pipe Sizes ½ 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: Copper-plated carbon-steel ring.

2.2 ACCESSORIES

A. Hanger Rods: Galvanized or Cadmium, threaded both ends, threaded on one end, or continuous threaded with double lock nut.

2.3 INSERTS

A. Inserts: Malleable iron case of galvanized outside and steel shell inside and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 FLASHING

A. Metal Flashing: 22 gage thick galvanized steel.

B. Metal Counter-flashing: 20 gage thick galvanized steel.

- C. Lead Flashing:
  - 1. Waterproofing: 5 lb./sq. ft sheet lead
  - 2. Soundproofing: 1 lb./sq. ft sheet lead.
- D. Flexible Flashing: 47 mil thick sheet butyl compatible with roofing.
- E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

## 2.5 EQUIPMENT CURBS

- A. Fabrication: Welded 18 gage galvanized steel shell and base, mitered 3 inch cant, variable step to match root insulation, factory installed wood nailer.

## 2.6 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick 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 or wood.
- F. Stuffing and Fire-stopping Insulation: Glass fiber type, non-combustible.
- G. Sealant: Acrylic

## PART 3 –EXECUTION

### 3.1 INSTALLATION

### 3.2 INSERTS

- A. Provide inserts for placement in concrete forms.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches (100 mm).
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

### 3.3 PIPE HANGERS AND SUPPORTS

- A. Support horizontal piping as scheduled.
- B. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide copper plated hangers and supports for copper piping. Cush clamps or felt lined galvanized J-hangers acceptable.
- J. Design hangers for pipe movement without disengagement of supported pipe.
- K. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

### 3.4 EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment.

- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of steel members or steel pipe and fittings. 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 Counter-flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting 12 inches minimum above finished roof surface with lead worked 1 inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash, and seal.
- C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- D. Seal floor, shower and mop sink drains watertight to adjacent materials.
- E. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms for sound control.
- F. Provide curbs for mechanical roof installations 14 inches minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counter flashing mechanical equipment and lap base flashing on roof curbs. Flatten and solder joints.
- G. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

### 3.6 SLEEVES

- A. Set sleeves in position in forms. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping
- C. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.



- D. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing, fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel or stainless steel escutcheons at finished surfaces.

### 3.7 SCHEDULES

<u>PIPE SIZE (Inches)</u>	<u>MAX. HANGER SPACING (Feet)</u>	<u>DIAMETER (Inches)</u>
½ to 1-1/4	6.5	3/8
1-1/2 to 2	10	3/8
2-1/2 to 3	10	½
4 to 6	10	5/8
8 to 12	14	7/8
14 and over	20	1
PVC (All Sizes)	6	3/8
C.I. Bell and Spigot (or No-Hub) And at Joints	5	3/8

END OF SECTION