

SECTION 22 05 29 – HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Pipe hangers and supports.
2. Hanger rods.
3. Sleeves.
4. Mechanical sleeve seals.
5. Formed steel channel.

B. Related Sections:

1. Section 07 84 00 – Firestopping: Product requirements for firestopping for placement by this section.
2. Section 07 90 00 – Joint Protection: Product requirements for sealant materials for placement by this section.
3. Section 22 00 01 – General Plumbing Requirements.
4. Section 22 11 00 – Facility Water Distribution: Execution requirements for placement of hangers and supports specified by this section.
5. Section 22 13 00 – Facility Sanitary Sewerage: Execution requirements for placement of hangers and supports specified by this section.

1.02 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B31.9 – Building Services Piping.

B. ASTM International:

1. ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 – Method for Fire Tests of Building Construction and Materials.
3. ASTM E814 – Test Method of Fire Tests of Through Penetration Firestops.
4. ASTM F708 – Standard Practice for Design and Installation of Rigid Pipe Hangers.

- 5. ASTM E1966 – Standard Test Method for Fire-Resistive Joint Systems.
- C. American Welding Society:
 - 1. AWS D1.1 – Structural Welding Code – Steel.
- D. FM Global:
 - 1. FM – Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.
- E. Manufacturers Standardization Society of the Valve and Fittings Industry:
 - 1. MSS SP 58 – Pipe Hangers and Supports – Materials, Design and Manufacturer.
 - 2. MSS SP 69 – Pipe Hangers and Supports – Selection and Application.
 - 3. MSS SP 89 – Pipe Hangers and Supports – Fabrication and Installation Practices.
- F. Underwriters Laboratories Inc.:
 - 1. UL 263 – Fire Tests of Building Construction and Materials.
 - 2. UL 723 – Tests for Surface Burning Characteristics of Building Materials.
 - 3. UL 1479 – Fire Tests of Through-Penetration Firestops.
 - 4. UL 2079 – Tests for Fire Resistance of Building Joint Systems.
 - 5. UL – Fire Resistance Directory.
- G. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH – Certification Listings.

1.03 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.04 SUBMITTALS

- A. Section 01 33 00 – Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger and support locations and detail of trapeze hangers.
- C. Product Data:
 - 1. Hangers and Supports: Submit manufacturers catalog data including load

capacity.

- D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Indicate calculations used to determine load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- E. Manufacturer's Installation Instructions:
 - 1. Hangers and Supports: Submit special procedures and assembly of components.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- G. UL/FM assembly sheets or WH assembly sheets for fire rated penetrations.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years of documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum 3 years of documented experience.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Section 01 60 00 – Product Requirements: Requirements for transporting, handling, storing and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 – Product Requirements: Environmental conditions affecting products on site.

1.08 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.
- B. Contractor shall review all drawings, including structural drawings, for details regarding pipe supports, housekeeping pads, anchors, hangers, and guides.

1.09 WARRANTY

- A. Section 01 70 00 – Execution and Closeout Requirements: Product warranties and product bonds.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

A. Plumbing Piping – DWV:

1. Conform to ASTM F708, MSS SP58, MSS SP69, MSS SP89.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
6. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

B. Plumbing Piping – Water.

1. Conform to ASTM F708, MSS SP58, MSS SP69, MSS SP89.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
3. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
6. Copper Pipe Support: Copper-plated, Carbon-steel ring. Provide non-metallic coatings or inserts on attachments for electrolytic protection where attachments are in direct contact with copper piping.
7. Each hanger shall be properly sized to fit the supported pipe or fit the outside of the insulation on lines, hangers shall not penetrate insulation. Hangers shall bear on the outside of the insulation, which shall be protected by support shields as specified. Protect insulation from crushing by means of a section of rigid insulation to be installed at hanger points.
8. Perforated strap iron or wire will not, under any circumstances, be acceptable as hanger material.

2.02 ACCESSORIES

- ### A. Hanger Rods: Galvanized mild steel threaded both ends, threaded on one end, or continuous threaded.

- B. Saddles: Metallic supports: ANSI/MSS SP-69 & SP-58 Type 40 shields and Type 30 saddles, galvanized, with partial bottom rib to center clevis hanger.

2.03 ATTACHMENT TO STRUCTURE

A. Attachment:

1. The load and spacing on each hanger and/or insert shall not exceed the safe allowable load for any component of the support system, including the concrete which holds the inserts. Reinforcement at inserts shall be provided as required to develop the strength required.
2. All supports shall be designed and installed to avoid interference with other piping, hangers, ducts, electrical conduit, supports, building structures, equipment, etc. All piping shall be installed with due regard to expansion and contraction and the type of hanger method of support, location of support, etc. shall be governed in part by this Specification.
3. Hangers shall be attached to the structure as follows:
 - a. Steel Bar Joists: Where pipes and loads are supported under bar joists, hanger rods may be run through the space between the bottom angles and secured with a washer and two nuts. Where larger lines are supported beneath bar joists, hanger rods shall be secured to angle irons of adequate size; each angle shall span across two or more joists as required to distribute the weight properly and shall be welded to the joists or otherwise permanently fixed thereto.
 - b. Steel Beams: Where pipes and loads are supported under steel beams, approved type beam clamps shall be used.
 - c. Wood Framing: Where pipes and loads are supported from wood framing, hanger rods shall be attached to framing with side beam brackets or angle clips.
 - d. If it is necessary to install a method of fastening a hanger after the structure has been installed, then only clamps or drilled anchors shall be used.
4. Power-actuated fasteners (shooting) will not be acceptable under any circumstances.

(Note: Under no circumstances will the use of plastic anchors or plastic expansion shields be permitted for any purpose whatsoever.)

2.04 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. Sealant: Refer to Section 07 90 00.
- D. Provide UL/FM or Warnock Hersey approved assembly for sleeves through fire rated floors or walls.

2.05 FORMED STEEL CHANNEL

- A. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 – Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.

3.02 PREPARATION

- A. Do not drill or cut structural members.
- B. Obtain permission from Architect/Engineer before drilling or cutting structural members.
- C. All auxiliary steel required for supports, anchors, guides, etc. shall be provided by the Contractor unless specifically indicated to be provided by others.
- D. All supports shall be of type and arrangement to prevent excessive deflection, to avoid excessive bending stresses between supports, and to eliminate transmission of vibration.
- E. Contractor shall be responsible for structural integrity of all supports, anchors, guides, etc. All structural hanging materials shall have a minimum safety factor of 5 built in.

3.03 INSTALLATION – PIPE HANGERS AND SUPPORTS

- A. Install in accordance with ASME 31.9, ASTM F708, MSS SP 69 and MSS SP 89.
- B. Support horizontal piping as scheduled.
- C. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- D. Place hangers within 12 inches of each horizontal elbow.
- E. Use hangers with 1-1/2 inch minimum vertical adjustment.
- F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- G. Where piping is installed in parallel and at same elevation, provide multiple pipe or

trapeze hangers.

- H. Provide non-metallic coatings or inserts on attachments for electrolytic protection where attachments are in direct contact with copper piping.
- I. Design hangers for pipe movement without disengagement of supported pipe.
- J. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 22 07 00.
- K. Supports, hangers, anchors, and guides shall be fastened to the structure only at such points where the structure is capable of restraining the forces in the piping system.
- L. Cast iron soil pipe 6 inches and smaller shall be supported at each joint, within 18 inches of joint. Cast iron soil pipe 8 inches and larger shall be supported on both sides of each joint when horizontal run exceeds five (5) feet.
- M. Where piping runs in multiple and at the same level, trapeze hangers (or roof curbs/rails) shall be installed.
- N. Insulated Piping: Insulated piping shall be supported with inserts of the same thickness as the insulation, or with other approved methods. Refer also to Section 22 07 00 – Piping Systems Insulation.

3.04 INSTALLATION – SLEEVES

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors 2 inches above finished floor level. Caulk sleeves.
- E. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with stuffing insulation and caulk [airtight]. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- F. Install stainless steel escutcheons at finished surfaces.
- G. Where installed in fire rated wall, floors, etc., install in accordance with UL/FM or Warnock Hersey fire rated assembly instructions.

3.05 FIELD QUALITY CONTROL

- A. Section 01 40 00 – Quality Requirements, 01 70 00 – Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

3.06 CLEANING

- A. Section 01 70 00 – Execution and Closeout Requirements: Requirements for cleaning.

- B. Clean adjacent surfaces of firestopping materials.

3.07 PROTECTION OF FINISHED WORK

- A. Section 01 70 00 – Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect adjacent surfaces from damage by material installation.

3.08 SCHEDULES

PIPE HANGER SPACING		
PIPE MATERIAL	MAXIMUM HANGER SPACING Feet	HANGER ROD DIAMETER Inches
Cast Iron, up to 2 inches	5	3/8
Cast Iron, 3 inches	5	1/2
Cast Iron, 4 inches	5	5/8
Copper Tube, 1-1/2 inches and smaller	6	3/8
Copper Tube, 2 inches thru 4 inches	8	1/2
PVC (All Sizes)	4	3/8
Steel, 3 inches and smaller	12	1/2

END OF SECTION