

SECTION 220529 – HANGERS AND SUPPORTS FOR PLUMBING AND EQUIPMENT

PART 1 - GENERAL

1.01 BUY AMERICAN REQUIREMENTS

- A. Provide certificates to show that all products meet the following requirements.
 - 1. American Iron and Steel (AIS)
 - 2. Build America, Buy America Act
- B. See Supplementary Conditions for details.

1.02 SUMMARY

- A. Section Includes:
 - 1. Pipe hangers and supports.
 - 2. Hanger rods.
 - 3. Inserts.
 - 4. Flashing.
 - 5. Sleeves.
 - 6. Mechanical sleeve seals.
 - 7. Formed steel channel.
 - 8. Equipment bases and supports.

1.03 REFERENCES

- A. American Society of Mechanical Engineers:
 - 1. ASME B31.1 - Power Piping.
 - 2. ASME B31.9 - Building Services Piping.
- B. ASTM International:
 - 1. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
 - 2. 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.
- G. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Section 014000 "Quality Requirements": Environmental conditions affecting products on site.

1.05 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. Manufacturers: Grinnell.
- A. Plumbing Piping - Water:
 - 1. Conform to ASME B31.9.
 - 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 Over: Carbon steel, adjustable, clevis.
 - 4. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
 - 5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 6. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
 - 7. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
 - 8. Vertical Support: Steel riser clamp.
 - 9. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 10. 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.

- 11. Copper Pipe Support: Copper-plated, Carbon-steel ring.

2.02 ACCESSORIES

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

2.03 INSERTS

- A. Manufacturers: Hilti.
- B. Inserts: Malleable iron case of steel shell 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.

2.04 FLASHING

- A. Metal Flashing: 26 gage thick galvanized steel.
- B. Metal Counterflashing: 22 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 compatible with roofing.
- E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.05 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: Acrylic.

2.06 MECHANICAL SLEEVE SEALS

- A. Manufacturers: Thunderline Link-Seal, Inc. Model "L" or approved equal.
- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and

pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

- C. Designed for use with steel or plastic pipe.
- D. Sleeve: Molded non-metallic HDPE sleeve with integral hollow, molded water-stop ring minimum four inches larger than the outside diameter of the sleeve itself. Provide pipe caps for use during concrete pouring. Thunderline Link-Seal Model CS or approved equal.

2.07 FORMED STEEL CHANNEL

- A. Manufacturers: B-Line Systems.
- B. Product Description: Galvanized 12 gage thick steel, with holes 1-1/2 inches on center.

2.08 FIRESTOPPING

- A. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
 - 1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
 - 2. Foam Firestopping Compounds: Single component foam compound.
 - 3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
 - 4. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with silicone elastomer for smoke stopping.
 - 5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
 - 6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
 - 7. Firestop Pillows: Formed mineral fiber pillows.
- B. Color: Dark gray.

2.09 FIRESTOPPING ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- B. Dam Material: Permanent:
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

D. General:

1. Furnish UL listed products [or products tested by independent testing laboratory].
2. Select products with rating not less than rating of wall or floor being penetrated.

E. Non-Rated Surfaces:

1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
2. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or water-stop type wall sleeve.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017300 "Execution": Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.
- C. Verify openings are ready to receive firestopping.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Obtain permission from Architect/Engineer before using powder-actuated anchors.
- D. Do not drill or cut structural members.

3.03 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install in accordance with ASME B31.1.
- 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. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- H. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
- I. Support riser piping independently of connected horizontal piping.
- J. Provide copper plated hangers and supports for copper piping or sheet lead packing between hanger or support and piping.
- K. Design hangers for pipe movement without disengagement of supported pipe.
- L. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- M. Provide clearance for hangers from structure and other equipment for installation of insulation. Refer to Section 220700.

3.04 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment. Refer to Structural Sheet Note for Concrete Specification.
- B. Using templates furnished with equipment, install 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.

3.05 INSTALLATION - FLASHING

- A. Provide flexible flashing and metal counterflashing where piping penetrates weather or waterproofed walls, floors, and roofs.
- B. 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.

3.06 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 1 inch above finished floor level. Caulk sleeves.
- E. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with firestopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

3.07 INSTALLATION - FIRESTOPPING

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping and other items, requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.
- D. Fire Rated Surface:
 - 1. Seal opening at floor, wall, partition, ceiling, and roof as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - c. Pack void with backing material.
 - d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
 - 2. Where cable tray, bus, cable bus, conduit, wireway, trough, and penetrates fire rated surface, install firestopping product in accordance with manufacturer's instructions.
- E. Non-Rated Surfaces:
 - 1. Seal opening through non-fire rated wall, partition floor, ceiling, and roof opening as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
 - b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
 - c. Install type of firestopping material recommended by manufacturer.

2. Install escutcheons, floor plates, or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
3. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, in accordance with manufacturer's instructions.
4. Interior Partitions: Seal pipe. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.08 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.09 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.10 PROTECTION OF FINISHED WORK

- A. Section 017300 "Execution": Requirements for protecting finished Work.
- B. Protect adjacent surfaces from damage by material installation.

3.11 SCHEDULES

PIPE HANGER SPACING		
PIPE MATERIAL	MAXIMUM HANGER SPACING Feet	HANGER ROD DIAMETER Inches
Cast Iron (All Sizes)	5	5/8
Cast Iron (All Sizes) with 10-foot length of pipe	10	5/8
Copper Tube, 1-1/4 inches and smaller	6	3/8
Copper Tube, 1-1/2 inches to 2 inches	8	3/8
Copper Tube, 2-1/2 inches and larger	8	1/2
PEX Tube	3	3/8
Steel, 2 inches and smaller	10	3/8
Steel, 2-1/2 inches to and 3 inches	11	1/2

PIPE HANGER SPACING		
PIPE MATERIAL	MAXIMUM HANGER SPACING	HANGER ROD DIAMETER
	Feet	Inches
Steel, 4 inches and larger	14	5/8

3.12 START-UP/DEMONSTRATION

- A. As specified in Section 017700 "Closeout Procedures.
- B. The CONTRACTOR shall demonstrate to the satisfaction of the DEPARTMENT, the complete and proper support of all piping systems. The demonstration shall include, but not be limited to the following:
 - 1. Proper installation and support of all piping systems, including the installation of sleeves, seismic bracing, anchors and expansion joints.

END OF SECTION

THIS PAGE LEFT INTENTIONALLY BLANK