



## SECTION 15062

### NON-PENETRATING ROOFTOP PIPE, EQUIPMENT, WALKWAY AND ACCESS SUPPORTS

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Portable, non-penetrating, rooftop support system for:
  - 1. Piping.
  - 2. Ducts.
  - 3. Cable Trays, Conduits and cables.
  - 4. HVAC equipment.
  - 5. Plumbing equipment.
  - 6. Telecommunications equipment.
  - 7. Industrial process equipment.
  - 8. Walkways, Crossovers, Stairs and Ramps.
  - 9. Platform Systems.
  - 10. Solar Panel Supports.
  - 11. Seismic and High Wind application for items listed above.
  - 12. \_\_\_\_\_.

##### 1.2 RELATED SECTIONS

- A. Section 07 00 00 - Thermal & Moisture Protection
- B. Section 07 71 00 - Roof Specialties
- C. Section 07720 - Roof Accessories.
- D. Section 07 72 46 - Roof Walkways
- E. Section 07590 - Roof Maintenance and Repairs.
- F. Section 07760 - Roof Pavers.
- G. Section 07700 - Roof Specialties and Accessories.
- H. Section 07710 - Manufactured Roof Accessories.
- I. Section 15060 - Hangers and Supports.
- J. Section 15070 - Mechanical Sound, Vibration, and Seismic Control.
- K. Section 15090 - Mechanical Restoration and Retrofit.
- L. Section 15411 - Fittings, Trim, and Accessories.
- M. Section 15700 - Heating, Ventilating, and Air Conditioning Equipment.
- N. Section 15820 - Duct Accessories.
- O. Section 16070 - Hangers and Supports.

- P. Section 16700 - Communications.
- Q. Section 21 00 00 - Fire Suppression
  - 1. 21 05 29 - Hangers & Supports for Fire Suppression Piping & Equipment
  - 2. 21 05 48 - Vibration & Seismic Controls for Fire Suppression Piping & Equipment
- R. Section 22 00 00 – Plumbing
  - 1. 22 05 29 - Hangers & Supports for Plumbing, Piping & Equipment
  - 2. 22 05 48 - Vibration & Seismic Controls for Plumbing, Piping & Equipment
- S. Section 23 00 00 - Heating, Ventilating, and Air Conditioning (HVAC)
  - 1. 23 05 29 - Hangers & Supports for HVAC Piping & Equipment
  - 2. 23 05 48 - Vibration & Seismic Controls for HVAC Piping & Equipment
- T. Section 23 33 00 - Air Duct Accessories
- U. Section 26 00 00 – Electrical
- V. Section 27 00 00 - Communications

### 1.3 REFERENCES

- A. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- B. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM A 525 - Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
- D. ASTM D 1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
- E. MSS SP-58 - Pipe Hangers and Supports -- Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry.
- F. MSS SP-69 - Pipe Hangers and Supports -- Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry.

### 1.4 SYSTEM DESCRIPTION

- A. Support piping on roof with an engineered prefabricated PHP System designed for installation without roof penetrations, flashing or damage to the roofing material. The system shall consist of bases, made of high density polypropylene plastics with UV Protection, a HDG structural steel frame and suitable pipe hangers for the application. Nuts, threaded rods and washers shall be HDG, spring nuts and bolts for spring nuts will be electro-plated. System shall be custom designed to fit piping and conduit to be installed and the actual conditions of service.
- B. Support ductwork on roof with an engineered prefabricated PHP-Duct System designed for installation without roof penetrations, flashing or damage to the roofing material. The system shall consist of bases, made of high density polypropylene

plastics with UV Protection, and a HDG structural steel frame. Nuts, threaded rods and washers shall be HDG, spring nuts and bolts for spring nuts will be electro-plated. System shall be custom designed to fit the load requirements that will be required.

- C. Support elevated walkway systems routed across the roof with an engineered prefabricated PHP-Walkway System designed for installation without roof penetrations, flashing or damage to the roofing material. The system shall consist of bases, made of high density polypropylene plastics with UV Protection, a galvanized structural steel frame, walkway planking, and handrail if required. Nuts, threaded rods and washers shall be HDG, spring nuts and bolts for spring nuts will be electro-plated. System shall be custom designed to fit the load requirements that will be required.
- D. Support PHP Telecommunication Platform System on the roof with an engineered prefabricated PHP Platform System designed for installation without roof penetration, flashing or damage to the roofing material. The system shall be designed to support all weight as required and shall consist of bases, made of high density polypropylene plastics with UV protection, galvanized substructures, bar grating and handrails if required. Nuts, threaded rods and washers shall be HDG, spring nuts and bolts for spring nuts will be electro-plated.
- E. Seismic and High Wind applications are available for all categories listed above.

#### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Show installation layout, sizes of units, and details of installation.
- D. Verification Samples: Actual samples of bases, each type of support, hanger, and fasteners, and not less than 12 inches (300 mm) of framing members.
- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- F. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment of components.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing pipe support systems, with a minimum of eight years of documented experience.
- B. Installer Qualifications: Company approved by manufacturer and with not less than five years of experience in installation of piping support systems.
- C. References: Submit list of references comprising not less than 10 installations that have been in use for a minimum of five years. Include contact name and phone numbers for each reference.
- D. Pre-Installation Meeting: After approval of submittals, but before beginning installation, conduct a meeting at project site attended by Architect, Contractor, installers of roofing, and mechanical and electrical piping to be installed on pipe

support systems.

1. Purpose of meeting is to describe in detail the installation process and to establish agreement, coordination, and responsibilities.
2. Prepare detailed meeting report and distribute copies to the Architect and all attendees.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials to project site in manufacturer's original packaging, marked with manufacturer's name, product model names and catalog numbers, identification numbers, and other related information.
- B. Store materials under cover until needed for installation.

## 1.8 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Warranty: PHP Systems/Design 5 year limited warranty to repair or replace, at our option, any products we find to be structurally defective in material or workmanship. Warranty is not valid if System was modified, installed incorrectly, or not designed by Portable Pipe Hangers. PHP Systems/Design.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: PHP Systems/Design, which is located at: 5534 Harvey Wilson Dr. ; Houston, TX 77020; Toll Free Tel: 800-797-6585; Tel: 713-672-5088; Email: [request info \(info@phpsd.com\)](mailto:info@phpsd.com); Web: [www.phpsd.com](http://www.phpsd.com)
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- C. Substitutions must be submitted and approved seven days prior to date of pre-bid conference.

### 2.2 APPLICATION

- A. Support pipes, conduit, cable trays, and ducts minimum of 6 inches (150 mm) above roof surface.
  1. Support Spacing: \_\_\_\_ feet (\_\_\_\_ mm).
  2. For Electrical and Gas Lines 2-1/2 inches (64 mm) in Diameter or Less, up to 10 inches (254 mm) above roof: Portable Pipe Hanger Model number: SS8.
  3. For Electrical and Gas Lines 3-1/2 inches (89 mm) in Diameter or less, up to 16 inches (406 mm) above roof: Portable Pipe Hanger Model number PP10.
  4. For Gas Lines 4 to 6 inches (100-150 mm) in Diameter, up to 12 inches (305 mm) above roof: Portable Pipe Hanger Model number RB18.
  5. For single Electrical and Gas Lines 3 to 8 inches (80-200 mm) in Diameter: Portable Pipe Hanger Model number PS 1-2.
  6. For Multiple Lines: Portable Pipe Hanger Model number PSE custom.
  7. For Ductwork: Portable Pipe Hanger Model number PPH-D - Goal Post style.
  8. For Ductwork: Portable Pipe Hanger Model number PPH-D - Enclosed style.
  9. Accessories for PSE Custom and Other Applications when required
    - a. On Sloped Roof Surfaces, Where Slope Exceeds 1/4 inch per foot (13 mm per 305 mm): Provide base with swivel for slope adjustment. Note: PHP Approved bracing required when using base with swivel.
    - b. Un-insulated Piping: Roller support or clevis hanger.

- c. Insulated Piping: Band hanger supported from horizontal strut or clevis hanger with Insulation Protection Shield.
  - d. Conduit: Band hanger supported from horizontal strut.
  - e. Bracing required when using base with swivel, when pipe exceeds 24 inches (610 mm) above roof, or when thermal expansion of pipe is great.
- B. Walkway, Crossover, Stairs, Ramps and Equipment Platform Access: Elevated walkway systems as manufactured by PHP Systems/Design.
- 1. Support Spacing: \_\_\_\_ feet (\_\_\_\_ mm).
  - 2. Bases High Density Polypropylene plastics with additives for UV protection
  - 3. Substructure: 12 gauge back-to-back strut G-1012A, or approved equal supported directly from the bases.
  - 4. Grating: Mill-galvanized carbon steel in accordance with ASTM A525:
    - a. Gauge 14-ga. steel.
    - b. Gauge 18-ga. steel.
    - c. Section Width: 12 inches (305 mm) (standard),
    - d. Section Width: 9 inches (229 mm).
    - e. Section Width: 6 inches (152 mm).
    - f. Channel Height: 1 inch (25.5 mm)
    - g. Channel Height: 2 inches (51 mm) (standard).
    - h. Flange Options: FM
    - i. Flange Options: MM.
    - j. Surface Condition: MG-traction grip
    - k. Surface Condition: MS-smooth.
  - 5. Handrail: 12 gauge, 1-5/8 inch (41 mm)strut G-5812, or approved equal.
  - 6. All substructures and handrails shall be galvanized steel. Spring nuts and bolts for spring nuts will be electro-plated.
- C. Telecom Platforms: Portable Pipe Hangers Telecommunications Platform Systems shall be manufactured by PHP Systems/Design.
- 1. Support Spacing: \_\_\_\_ feet (\_\_\_\_ mm).
  - 2. Bases High Density Polypropylene plastics with additives for UV protection
  - 3. Provide with leveling assembly for height adjustment.
  - 4. Substructure: 12 gauge back-to-back strut G-1012A, or approved equal supported directly from the bases.
  - 5. Grating: Bar grating type WB-4, mill-galvanized carbon steel in accordance with ASTM A 525:
    - a. Section Width as required.
    - b. Bar grating height: 1 inch (25.5 mm)
    - c. Surface Condition: Serrated.
  - 6. Handrail: 12 gauge, 1-5/8 inch (41 mm) strut G-5812, or approved equal.
  - 7. All substructures and handrails shall be galvanized steel. Spring nuts and bolts for spring nuts will be electro-plated.
- D. Attachment of Base to Roof Surface when required for Seismic and High Wind Application:
- 1. No attachment to roof surface.
  - 2. Adhesive attachment to roof surface.
  - 3. Mechanically fastened to roof deck.

## 2.3 MATERIALS

- A. Portable Support System: Engineered, portable system specifically designed for installation without the need for roof penetrations or flashings, and without causing damage to the roofing membrane.
- 1. Design system using high density / high impact polypropylene bases with

- carbon black, anti-oxidants for UV protection, and steel framing for support is 1-5/8 inch (41 mm) B22TH or 1-7/8 inch (48 mm) BTS22TH.
2. Custom design system to fit piping, conduits, equipment, or walkways to be installed and actual conditions of service and loading.
  3. Piping Supports: Provide suitable hangers and supports.
  4. Duct and Equipment Supports: Factory fabricated to support exact duct sizes and equipment to be installed.
  5. Walkways and Platforms: Provide galvanized slotted metal grating, in configurations as indicated, and tubular handrails where indicated.
- B. Bases: Injection molded high density / high impact polypropylene with UV-inhibitors and anti-oxidants, conforming to the following:
1. Moisture Content: Negligible.
  2. Shrinkage/Swelling Due to Moisture: Negligible.
  3. Density: 55.8 lb/cu ft (894 kg/cu m).
  4. Insect Resistance: No known insect damage potential.
  5. Chemical Resistance (oil, brake fluid, gasoline, diesel, antifreeze, battery acid, and sulfuric acid: No visual or physical change apparent.
  6. Flammability: No ignition after 10 minutes, 25 kW/m, when tested in accordance with ASTM D 1929.
  7. Sized as required by loading conditions and as indicated on the drawings.
  8. Shop fabricated with inserts for square tubing or threaded rods as required.
  9. Color: Integral black color as molded.
  10. Bases for Mechanical Attachment: Sealant chamber around penetration point, with injection port for sealing after fastening; beveled lip for sealant bead around entire diameter.
  11. Do not use bases containing carbonated plastics, press molded recycled rubber and plastics, steel, stainless steel, or any injection molded threaded receivers.
- C. Steel Framing:
1. Channel Types: 1-5/8 inch (41.3 mm) B22TH or 1-7/8 inch (47.6 mm) BTS22H, as required for loading conditions.
  2. Thickness: 12 gage (2.7 mm).
  3. Form: Roll-formed 3-sided or tubular shape, perforated with 9/16 inch (14.3 mm) holes at 1-7/8 inch (47.6 mm) centers on three sides.
  4. Finish: Hot dip galvanize in accordance with ASTM A 123 after fabrication, free of roughness, whiskers, unsightly spangles, icicles, runs, barbs, sags, droplets, and other surface blemishes.
  5. Do not use tubing or tube steel.
- D. Stainless Steel Framing:
1. Channel Types: 1-5/8 inch (41.3 mm) or 1-7/8 inch (47.6 mm), as required for loading conditions.
  2. Thickness: 12 gage (2.7 mm).
  3. Form: Roll-formed 3-sided or tubular shape.
  4. Finish: Mill finish.
  5. Do not use tubing or tube steel.
- E. Pipe Supports and Hangers: Conform to MSS SP-58 and MSS SP-69 and as follows:
1. Fabricate of carbon steel where framing is carbon steel; fabricate of stainless steel where framing is stainless steel; finished same as framing.
  2. Sizes 2-1/2 inch (63 mm) and smaller: Single roller supports for piping subject to expansion and contraction; 3-sided channels and pipe clamps.
  3. Sizes 3 inch (76 mm) and larger: Rollers, clevis hangers, or band hangers, to

allow for expansion and contraction without movement of the bases or framing.

- F. Accessories: Clamps, bolts, nuts, washers, and other devices as required for a complete system.
  - 1. Carbon Steel: Hot-dip galvanized in accordance with ASTM A 153/A 153M.
  - 2. Stainless Steel: Mill finish.
  - 3. For Mechanical Fastening to Deck: On wood and steel decks, use bolts with toggle wings; on concrete decks use threaded rods and adhesive anchors, with rod embedded at least 1-3/4 inches (44 mm) into concrete.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that roofing system is complete and that roof surfaces are smooth, flat, and ready to receive work of this section.
- B. Verify that roof surface temperature is at minimum 60 degrees F (15.5 degrees C), for proper adhesive performance.

### 3.2 PREPARATION

- A. Clean surfaces of roof in areas to receive portable support bases.
  - 1. Remove loose gravel from gravel surfaced roofs.
  - 2. Remove dirt, dust, oils, and other foreign materials.
- B. Use care in handling portable support system components during installation, to avoid damage to roofing, flashing, equipment, or related materials.

### 3.3 INSTALLATION

- A. Pipe, Duct, Cable, and Conduit Support Systems:
  - 1. Locate bases and support framing as indicated on drawings and as specified herein. Provide complete and adequate support of all piping, ducts, and conduit, whether or not all required devices are shown.
  - 2. The use of wood for supporting piping is not permitted.
  - 3. Provide supports spaced so deflection of piping does not exceed 1/240 of span.
  - 4. Install framing at spacing indicated, but in no case at greater than 10 feet (3 m) on center.
  - 5. Accurately locate and align bases.
    - a. Consult manufacturer of existing or new roofing system as to the type of isolation pads required between the roof and base.
    - b. Set isolation pads in adhesive if required by manufacturer's instructions.
    - c. Place bases on isolation pads.
    - d. Adhere or mechanically attach if required by code.
    - e. Where applicable, replace gravel around bases.
  - 6. Set framing posts into bases and assemble framing structure as indicated.
  - 7. Use galvanized fasteners for galvanized framing and stainless steel fasteners for stainless steel framing.
- B. Duct Support Systems
  - 1. Locate bases and support framing as indicated on drawings and as specified herein. Provide complete and adequate support of all piping, ducts, and conduit, whether or not all required devices are shown.

2. Accurately locate and align bases.
    - a. Consult manufacturer of existing or new roofing system as to the type of isolation pads required between the roof and base.
    - b. Set isolation pads in adhesive if required by manufacturer's instructions.
    - c. Place bases on isolation pads.
    - d. Adhere or mechanically attach if required by code.
    - e. Where applicable, replace gravel around bases.
  3. Place pre-assembled support on bases and attach framing post to base bracket with 1/2 inch bolts provided and adjust as needed. Support shall be adjustable to maintain existing elevation and slope.
  4. Use galvanized fasteners for galvanized framing and stainless steel fasteners for stainless steel framing.
- C. Walkway, Crossover & Equipment Platform Access:
1. Install substructures at spacing indicated, but not greater than 5 feet (1.5 m) on center.
  2. Locate bases and support framing as indicated on drawings and as specified herein. Provide complete and adequate support of all structures.
  3. Accurately locate and align bases.
    - a. Consult manufacturer of existing or new roofing system as to the type of isolation pads required between the roof and base.
    - b. Set isolation pads in adhesive if required by manufacturer's instructions.
    - c. Place bases on isolation pads.
    - d. Adhere or mechanically attach if required by code.
    - e. Where applicable, replace gravel around bases.
  4. Set legs of substructures into bases as indicated.
  5. Use galvanized fasteners for galvanized framing and stainless steel fasteners for stainless steel framing.
  6. Layout and fasten planking to substructures.
  7. Where handrails are required, install as follows:
    - a. Install intermediate rails without tightening.
    - b. Make minor adjustments as needed, such as spacing of substructures to accommodate intermediate handrails, and install hold-downs.
    - c. Secure intermediate handrails and install top handrails.
- D. Telecommunications
1. Provide portable pipe hangers systems pre-assembled as much as possible.
  2. Locate bases and support framing as indicated on drawings and as specified herein. Provide complete and adequate support of all structures.
  3. Accurately locate and align bases.
    - a. Consult manufacturer of existing or new roofing system as to the type of isolation pads required between the roof and base.
    - b. Set isolation pads in adhesive if required by manufacturer's instructions.
    - c. Place bases on isolation pads.
    - d. Adhere or mechanically attach if required by code.
    - e. Where applicable, replace gravel around bases.
  4. Attached pre-assembled support to bases and adjust as needed. Note, support shall be adjustable to maintain existing elevation and slope.
  5. Lay out bar grating on substructures and attach.
  6. Use galvanized fasteners for galvanized framing and stainless steel fasteners for stainless steel framing.

### 3.4 FIELD QUALITY CONTROL



- A. Provide a factory-trained representative of the manufacturer to visit the site while the work is in progress to assure that the installation conforms to the design requirements and the manufacturer's installation requirements.

### 3.5 CLEANING AND PROTECTION

- A. Remove all packaging, unused fasteners, adhesive, and other installation materials from the project site.
- B. Remove adhesive from exposed surfaces of supports and bases, and leave the work in clean condition.
- C. Provide protection as required to leave the work in undamaged condition at the time of substantial completion.

END OF SECTION