



SECTION 07, 21, 22, 23, 26, 27

NON-PENETRATING PORTABLE ROOFTOP SUPPORTS AND WALKWAYS

For best results, display hidden notes to specifier.

PART 1 GENERAL

1.1 SECTION INCLUDES

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

- B. Portable rooftop walkway and platform system.

1.2 RELATED SECTIONS

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- A. Section 07 00 00- Thermal & Moisture Protection.
- B. Section 07 71 00- Roof Specialties.
- C. Section 07 72 00- Roof Accessories.
- D. Section 07 72 46- Roof Walkways.
- E. Section 07 76 00- Roof Pavers.
- F. Section 21 00 00- Fire Suppression.
- G. Section 21 05 29- Hangers & Supports for Fire Suppression Piping & Equipment.
- H. Section 21 05 48- Vibration & Seismic Controls for Plumbing, Piping & Equipment.
- I. Section 22 00 00- Plumbing.
- J. Section 22 05 29- Hangers & Supports for Plumbing, Piping & Equipment.
- K. Section 22 05 48- Vibration & Seismic Controls Plumbing, Piping & Equipment.
- L. Section 23 00 00- Heating, Ventilating & Air Conditioning (HVAC).
- M. Section 23 05 29- Hangers & Supports for HVAC.
- N. Section 23 05 48- Vibration & Seismic Controls for HVAC Piping & Equipment.
- O. Section 22 33 00- Air Duct Accessories.
- P. Section 26 00 00- Electrical.
- Q. Section 27 00 00- Communications.

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- A. Section 07590- Roof Maintenance and Repairs.
- B. Section 07700- Roof Specialties and Accessories.
- C. Section 07710- Manufactured Roof Accessories.
- D. Section 07720- Roof Accessories.
- E. Section 07760- Roof Pavers.
- F. Section 15050- Basic Mechanical Materials and Methods.
- G. Section 15060- Hangers and Supports.
- H. Section 15070- Mechanical Sound, Vibration, and Seismic Control.
- I. Section 15090- Mechanical Restoration and Retrofit.
- J. Section 15411- Fittings, Trim, and Accessories.
- K. Section 15700- Heating, Ventilating, and Air Conditioning Equipment.
- L. Section 15820- Duct Accessories.
- M. Section 16070- Hangers and Supports.
- N. Section 16700- 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 D 1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
- D. MSS SP-58 - Pipe Hangers and Supports -- Materials, Design and Manufacture; Manufacturers Standardization Society of the Valve and Fittings Industry.
- E. 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, flashings, 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. Pipe supports shall be manufactured by PHP Systems/Design i.e. Portable Pipe Hangers (see 2.2 A).
- B. Support ductwork on roof with an engineered, prefabricated PHP Duct System designed for installation without roof penetrations, flashings, 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. Duct supports shall be manufactured by PHP Systems/Design i.e. Portable Pipe Hangers (see 2.2 B).
- C. Support elevated walkway systems routed across the roof with an engineered, prefabricated PHP Walkway System, designed for installation without roof penetrations,

flashings, 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. Walkway Systems shall be manufactured by PHP Systems/Design i.e. Portable Pipe Hangers.

- D. Support PHP Telecommunication Platform System on the roof with an engineered, prefabricated PHP Platform System designed for installation without roof penetrations, flashings, 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. Telecommunication Platform Systems shall be manufactured by PHP Systems/Design i.e. Portable Pipe Hangers.
- E. Seismic and High Wind applications are available for all categories listed above.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Submit for all products proposed for use, describing physical characteristics and method of installation.
- 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.

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 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 the project site attended by the 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. Call (800) 797-6585 to set-up meeting.
 - 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 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Warranty: Portable Pipe Hangers 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 has been modified, installed incorrectly, or not designed by PHP Systems/Design i.e. Portable Pipe Hangers.
- C. Terms and Conditions (View/Download)

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: PHP Systems/Design i.e. Portable Pipe Hangers; 5534 Harvey Wilson Drive, Houston, Texas 77020. ASD. Tel: (800) 797-6585. Fax: (713) 672-1170. www.phpsd.com. Email:info@phpsd.com.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 APPLICATIONS

- A. Support pipes, conduit, cable trays, and ducting, a minimum of 6 inches (150 mm) above roof surface.
 - 1. Support Spacing: ____ feet (____ mm). 10 feet MAXIMUM.
 - 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 channel or clevis hanger with Insulation Protection Shield.
 - d. Conduit: Band hanger supported from horizontal channel.
 - 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 & Equipment Platform Access: Elevated walkway systems shall be manufactured by PHP Systems/Design i.e., Portable Pipe Hangers.
 - 1. Support Spacing: ____ feet (____ mm).
 - 2. Bases High Density Polypropylene plastics with additives for UV protection.
 - 3. Substructure: 12 gauge back-to-back channel 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) channel 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: PHP Telecommunications Platform Systems shall be manufactured by PHP Systems/Design i.e., Portable Pipe Hangers.
1. Support Spacing: ____ feet (____ mm).
 2. Bases: High Density Polypropylene plastics with additives for UV protection.
 3. Provided with leveling assembly for height adjustment.
 4. Substructure: 12 gauge back-to-back channel, 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 A525.
 - 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) channel 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 Applications.
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 of 1-5/8 inch (41 mm) B22TH or 1-7/8 inch (48 mm) BTS22TH for support.
 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 channel, 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 channel.
 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. Fabricated of carbon steel where framing is carbon steel; fabricated 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 steel plate to attach to deck; 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°F (15.5°C) for proper adhesive performance.

3.2 PREPARATION

- A. Clean surfaces of roof in areas to receive portable support bases.
 - 1. Sweep 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 Equipment Support Systems
 - 1. Locate bases and support framing as indicated on drawings and as specified herein. Provide complete and adequate support of all piping, ducting, and conduit; whether or not all required devices are shown.
 - 2. The use of wood for supporting piping is not permitted.
 - 3. Provide support spacing 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, ducting, 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 onto bases, attaching 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 PHP support 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. When requested by the Architect, 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 manufacturers design and 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 area in clean condition.
- C. Provide protection as required, leaving the work area in undamaged condition at the time of completion of work.

END OF SECTION