

PORTLAND SYSTEMS

PRE-ENGINEERED METAL BUILDINGS

STANDARD SPECIFICATIONS

These specifications subject to change without notice.

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SECTION 1. GENERAL

1.1. Scope

- 1.1.1. These specifications cover the materials and the fabrication of metal buildings designed, manufactured and furnished by PORTLAND SYSTEMS, LLC, hereinafter referred to as PORTLAND SYSTEMS.
- 1.1.2. These specifications are an outline of performance to insure that the architect, engineer, builder and/or owner understands the basis for design, manufacture and, application of all PORTLAND SYSTEMS metal building systems.
- 1.1.3. Because of a continuing program of research and development, specifications in this manual are subject to change without notice.

1.2. Building Description

- 1.2.1. Gable Symmetrical is a continuous frame building with the ridge in the center of the building, consisting of tapered or straight columns and tapered rafters. Sidewall girts may be continuous, by-passing the columns or simple span, flush in the column line. Building may or may not have interior columns.
- 1.2.2. Gable Unsymmetrical is a continuous frame building with an off-center ridge, consisting of tapered or straight columns and tapered rafters. Eave height and roof slope may differ on each side of the ridge. Sidewall girts may be continuous, by-passing the columns or simple span, flush in the column line. Building may or may not have interior columns.
- 1.2.3. Single Slope is a continuous frame building which does not contain a ridge, but consists of one continuous slope from side to side. Building consists of straight or tapered columns and tapered or straight rafters. Sidewall girts may be continuous, by-passing the columns or simple span, flush in the column line. Building may or may not have interior columns.
- 1.2.4. Lean-to (LT) is a building extension which does not contain a ridge, but consists of one continuous slope from side to side. These units usually have the same roof slope and girt design as the building to which they are attached.
- 1.2.5. All building types normally have simple span endwall girts flush in the column line.

1.3. Building Nomenclature

- 1.3.1. Roof slope is expressed as inches of rise for each 12" of horizontal run.
- 1.3.2. Building "Width" is measured from outside to outside of sidewall girts.
- 1.3.3. Building "Eave Height" is a nominal dimension measured from the bottom of the base plate of the column to the intersection of the inside of the roof and sidewall sheets.
- 1.3.4. Building "Length" is measured from outside to outside of endwall girts.
- 1.3.5. Standard "Bay Spacing" shall be 20', 25' or 30' between frame centerlines (except at end bays) unless otherwise specified, for buildings with "A", "AM", or "R" panels.
- 1.3.6. Standard "Bay Spacing" shall be 20', 24' or 28' between frame centerlines (except at end bays) for buildings with Shadow Rib Panels.
- 1.3.7. References to "Architectural" panel shall include "A" and "AM" panels.

1.4. Drawings and Certifications

- 1.4.1. Drawings: PORTLAND SYSTEMS shall furnish complete erection drawings for the proper identification and assembly of all building components. These drawings will show anchor bolt settings, transverse cross-sections, sidewall, endwall and roof framing, flashing and sheeting, and accessory installation details.
- 1.4.2. Certifications: Standard drawings and design analysis shall bear the seal of a registered professional engineer licensed in the state where the building is to be placed. Design analysis shall be on file and furnished by PORTLAND SYSTEMS upon request.

SECTION 2. STRUCTURAL STEEL DESIGN**2.1. General**

- 2.1.1. PORTLAND SYSTEMS shall use standards, specifications, recommendations, findings and/or interpretations of professionally recognized groups such as AISC, AISI, AAMA, AWS, ASTM, MBMA, Federal Specifications, and unpublished research by MBMA as the basis for establishing design, drafting, fabrication, and quality criteria, practices, and tolerances. For convenience, one or more sources may be referenced in a particular portion of these specifications. In all instances, however, PORTLAND SYSTEMS design, drafting, fabrication and quality criteria, practices, and tolerances shall govern, unless specifically countermanded by the contract documents.
- 2.1.2. Structural mill sections or welded up plate sections will generally be designed in accordance with the 9th edition of AISC's "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings", ASD method.
- 2.1.3. Cold-Formed steel structural members will generally be designed in accordance with the latest edition of AISI's "Specifications for the Design of Cold-Formed Steel Structural Members".

2.2. Design Loads

- 2.2.1. Design loads shall be as specified and set forth in the contract, and shall be in accordance with PORTLAND SYSTEMS standard design practices. Design loads may include dead load, roof live loads, wind loads, seismic loads, collateral loads, auxiliary equipment loads, and/or other applied or specified loads.
- 2.2.2. Dead Load - the actual weight of the building system supported by a given member.
- 2.2.3. Roof Live Loads - loads produced by maintenance activities, rain, erection activities, and other movable or moving loads by not including wind, snow, seismic, crane, or dead loads.
- 2.2.4. Roof Snow Load - gravity load induced by the weight of snow or ice on the roof, assumed to act on the horizontal projection of the roof.
- 2.2.5. Wind Loads - the loads on a structure induced by the forces of wind blowing from any horizontal direction.
- 2.2.6. Collateral Loads - the weight of any non-moving equipment or material, such as ceilings, electrical or mechanical equipment, sprinkler systems, or plumbing.
- 2.2.7. Auxiliary Loads - dynamic loads induced by cranes, conveyors, or other material handling systems.
- 2.2.8. Seismic Loads - horizontal loads acting in any direction a structural system due to action of any earthquake.
- 2.2.9. Floor Live Loads - loads induced on a floor system by occupants of a building and their furniture, equipment, etc.

SECTION 3. BASIC MATERIAL SPECIFICATIONS**3.1. Primary Framing Steel**

- 3.1.1. Steel for hot rolled shapes shall conform to the requirements of ASTM Specifications A-36, with minimum yield strength of 36,000, 42,000 or 50,000 psi.
- 3.1.2. Steel for built-up sections shall generally conform to the physical requirements of ASTM D529, ASTM 572 OR ASTM A36 as applicable, with minimum yield strength of 42,000, 50,000, or 55,000 psi as required by design.
- 3.1.3. Steel for endwall "C" sections shall generally conform to the physical requirements of ASTM A607 GR55M or equivalent, and have a minimum yield strength of 55,000 psi.

3.2. Secondary Framing Steel

- 3.2.1. Steel used to form purlins, girts, eave struts and "C" sections shall be Republic Steel P-55 or equivalent, comparable to the requirements of ASTM A607 Grade 55. Minimum yield strength shall be 55,000 psi.

3.3. Roof And Wall Panel Material

- 3.3.1. Roof panel material as specified shall be 26 or 24 gauge Galvalume as manufactured by Bethlehem Steel Corporation, or equal, conforming to the requirements of ASTM A799 Grade 80 or Grade 50. Minimum yield strength shall be 80 ksi for Grade 80 and 50 ksi for Grade 50.
- 3.3.2. Panel material as specified shall be 26 or 24 gauge Galvalume, conforming to the requirements of ASTM A792 Grade 50 or Grade 80. Minimum yield strength shall be 50 ksi for Grade 50.

3.3.3. See 5.1.4 for additional material used.

SECTION 4. STRUCTURAL FRAMING

4.1. General

- 4.1.1. All framing members shall be shop fabricated for field bolted assembly. The surfaces of the bolted connections shall be smooth and free from burrs or distortions.
- 4.1.2. All shop connections shall be in accordance with PORTLAND SYSTEMS standard design practices as specified in Paragraph 2.1.1. Certification of welder qualifications will be furnished when required and specified in advance.
- 4.1.3. All framing members, where necessary, shall carry an easily recognizable identifying mark.

4.2. Primary Framing

- 4.2.1. Rigid Frame: All rigid frames shall be welded built-up "I" sections or hot-rolled sections. The columns and the rafters may be either uniform depth or tapered. Flanges shall be connected to webs by means of a continuous fillet weld on one side.
- 4.2.2. Endwall Frames: All endwall roof beams and endwall columns shall be cold-formed "C" sections, mill-rolled sections, or built-up "I" sections depending on design requirements.
- 4.2.3. Plates, Stiffeners, etc.: All base plates, splice plates, cap plates, and stiffeners shall be factory welded into place on the structural members.
- 4.2.4. Bolt Holes, etc.: All base plates, splice and flanges shall be shop fabricated to include bolt connection holes. Webs shall be shop fabricated to include bracing holes.
- 4.2.5. Connections for secondary structural (purlins and girts) shall be by means of welded clips.

4.3. Secondary Framing

- 4.3.1. Purlins and Girts: Purlins and girts shall be cold-formed "Z" sections with stiffened flanges. Flange stiffeners shall be sized to comply with the requirements of the latest edition of AISI. Purlin and girt flanges shall be unequal in width to allow for easier nesting during erection. They shall be pre punched at the factory to provide for field bolting to the rigid rigid frames. They shall be simple or continuous span as required by design. Connection bolts will install through the webs, not flanges.
- 4.3.2. Eave Struts: Eave Struts shall be unequal flange cold-formed "C" sections.
- 4.3.3. Base Angle: A base member will be supplied by which the base of the wall covering may be attached to the perimeter of the slab. This member shall be secured to the concrete slab with ram-sets, expansion bolts, or equivalent anchors as shown on the drawings.

4.4. Bracing

- 4.4.1. Diagonal Bracing: Diagonal bracing in the roof and sidewalls shall be used to remove longitudinal loads (wind, crane, etc.) from the structure. This bracing will be furnished to length and equipped with bevel washers and nuts at each end. It may consist of rods threaded each end or galvanized cable with suitable threaded end anchors. If load requirements so dictate, bracing may be of structural angle and/or pipe, bolted in place.
- 4.4.2. Flange Braces: The compression flange of all primary framing shall be braced laterally with angles connecting to the webs of purlins or girts so that the flange compressive stress is within allowable limits for any combination of loading.
- 4.4.3. Special Bracing: When diagonal bracing is not permitted in the sidewall, a rigid frame type portal or fixed base columns will be used. Wind bracing in the roof and/or walls need not be furnished where it can be shown that the diaphragm strength of the roof and/or wall covering is adequate to resist the applied wind forces.

SECTION 5. ROOF AND WALL COVERING

5.1. General

- 5.1.1. Roof panels shall be any of the following: "R", "PBR", or standing seam. "PBR" panels shall have an extended purlin bearing leg. For standing seam see Sections 5.3 and 5.4.
- 5.1.2. Wall panels may be any of the following: "R", "U", "A", "AM", "PBR", "ShadowRib", or "NuWall" profile. Panel profiles "A", "AM", "ShadowRib", and "NuWall" are considered Architectural panels. "PBR" panels shall have an extended purlin bearing leg.
- 5.1.3. Panels "R", "PBR", "U", "A", or "AM" shall either be 26 or 24 gauge Galvalume Plus or pre-coated Galvalume steel. "NuWall" panel shall either be 22 or 24 gauge Galvalume Plus or pre-coated Galvalume steel.
- 5.1.4. Agricultural Panel - "Stormproof" liner panels as specified shall be 29 gauge (.014 minimum) Galvalume Plus or pre-painted Galvalume steel.

- 5.1.5. Retro-Fit Panel - "Retro R" roof or wall panels as specified shall be 29 gauge Galvalume Plus or pre-painted Galvalume steel.
- 5.2. Standing Seam Roof Panels - see Section 5.3 and 5.4. Panel Description**
- 5.2.1. "R" Panel shall have major ribs 1 1/4" high spaced 12" on center. In the flat area between the major ribs are two smaller minor ribs. Each panel shall provide 36" net coverage in width. All sidelaps shall be at least one major rib.
- 5.2.2. "U" Panel shall have ribs 3/4" high spaced 6" on center. Each panel shall provide 36" net coverage in width. All sidelaps shall be at least one rib.
- 5.2.3. "PBR" (Purlin bearing leg) Panels shall have major ribs 1 1/4" high spaced 12" centers. In the flat area between the major ribs are two smaller minor ribs. Each panel shall provide 36" net coverage in width. All sidelaps shall be at least one major rib.
- 5.2.4. Architectural ("A" or "AM") Panel shall have a configuration consisting of ribs 1 1/8" or 1 3/16" deep. Major corrugations shall be spaced 12" on center. Panel design produces a decorative smooth shadow line with semi-concealed fasteners. Architectural panels shall provide a 36" net coverage in width. All sidelaps shall be at least one major rib.
- 5.2.5. Architectural ShadowRib Panel shall have a configuration consisting of a 5 1/4" flat area with a 1 1/2" deep indentation in the middle of the panel. The panel coverage is to be 16", with a panel depth of 3".
- 5.2.6. Architectural "NuWall " Panel shall be 2 1/2" deep x 12" wide with 1/2" deep fluting with concealed fasteners. "Stormproof " Panel shall have major ribs 3/4" high spaced 9" on center. In the flat area between the major ribs are two smaller minor ribs. Each panel shall provide 36" net coverage in width. All side laps must be at least one major rib.
- 5.2.7. "Retro R" (Retro-Fit) panels shall have major ribs 1" high at 12" centers. Each panel shall provide 36" net coverage in width. All sidelaps shall be at least one major rib. This panel is designed to go over existing "R" panel roof. The existing roof panels do not have to be removed.
- 5.2.8. "Artisan 1 " Liner/Soffit Panel shall be flat, 1" high and provide 12" net coverage width. Panels shall be interlocking and be fastened with a concealed fastener. Panels are also available with two stiffening ribs.
- 5.2.9. Panel Length: All wall panels shall be continuous from sill to roof line and all roof panels shall be continuous from eaveto ridge except where lengths become prohibitive for handling purposes. All end laps shall be at least 6" on roof and 4" on walls.
- 5.2.10. Endwall Edge Cuts: All endwall panels for buildings with 1:12 or less roof slope shall be square cut. All endwall panels for buildings with more than 1:12 roof slope shall be bevel cut by the erector in the field.
- 5.3. Standing Seam Roof Panel Type - WeatherRoof II (Snap-Lock) and WeatherRoof III (Machine Seamed)**
- 5.3.1. Standing Seam Roof Panels shall be UL-90 rated, roll-formed, 24 or 22 gauge Galvalume, whether Galvalume Plus or pre-painted. Galvalume sheet shall have a coating weight of .5 oz./sq. ft. with a minimum yield strength of 50,000 ksi and conform to ASTM-792. Pre-painted finish shall be a premium Floropon coating produced with either Kynar 500 or Hylar 5000 resins and have a full 20 year warranty.
- 5.3.2. Panels shall be 24" wide with 2 minor ribs in between seams. Panel seam is 3" high.
- 5.3.3. One side of the panel shall be female in configuration, which will have factory applied hot- melt mastic (see 5.3.9) inside the female seam. The female seam will snap over the male side. When using WeatherRoof II Standing Seam, this procedure will form a self-locking snap system. If choosing WeatherRoof III Standing Seam, the male and female seams will be continuously locked together by an electrically powered seamer, forming a 360 degree Pittsburgh Seam.
- 5.3.4. The panels shall be factory notched at both ends so that field installation can commence or terminate from either end of the building. Panels cannot start at both ends of the building and work towards each other.
- 5.3.5. Maximum panel length shall be no more than 45'-0" unless otherwise discussed and approved by PORTLAND SYSTEMS sales or manufacturing manager.
- 5.3.6. Endlaps
- 5.3.6.1. Endlaps shall have a 16 gauge backup plate. The panel shall have five pre-punched holes in the flat and dimples in the trapezoidal legs for proper placement of fasteners.
- 5.3.6.2. Mastic (see 5.3.5) shall be applied between the panels and secured with 14" - #14 x 1 1/4 self drilling fasteners through the panels, and backup plate to form a compression joint.
- 5.3.6.3. Endlaps and eaves shall be the only places in the roof system where through the roof fasteners can be used inside the building envelope.
- 5.3.7. Fasteners
- 5.3.7.1. Eave - 1/4" - #14 x 1 1/4" long life self drilling with sealing washer.
- 5.3.7.2. Endlaps - 1/4" - #14 x 1 1/4 long life self drilling with sealing washer.
- 5.3.7.3. Ridge - #14 x 7/8" Lap Tek long life self-drilling with sealing washer.
- 5.3.7.4. Clips/to purlin - 1/4" - #14 x 1 " Tek 2 long life self-drilling with Hex Washer Head and 5/8" O.D. washer.
- 5.3.7.5. Clips/floating to bar joists - #12-24 x 1 1/4" Tek 4.5 self-drilling with Washer Head and 5/8" O.D. washer.

- 5.3.7.6. Long Life fasteners, where exposed, are standard when using a Galvalume Plus roof panel.
- 5.3.8. Clips
- 5.3.8.1. All clips shall have factory applied mastic and be designed so that movement between the panel and the clip does not occur.
- 5.3.8.2. Low fixed clips - shall be 3 3/8" in height providing a 3/8" clearance for insulation between the panel and the purlin does not occur.
- 5.3.8.3. High fixed clips - shall be 4 3/8" in height to accommodate a thermal spacer for added insulation at the purlins.
- 5.3.8.4. Low or high floating clips - shall be either 3 3/8" or 4 3/8" in height. Floating clips shall provide a minimum of 2" travel to allow for expansion and contraction.
- 5.3.9. Sealants And Closures
- 5.3.9.1. Factory applied sealant used in panel sidelaps shall be a hot melt, foamable mastic - Q41A.
- 5.3.9.2. Field applied sealant used at the endlaps, eave, ridge assembly, and gable flashings shall be 100% solids butyl-based elastomeric tape sealant, furnished in roll form or pre-cut to length. See manual for application.
- 5.3.9.3. Outside closures shall be manufactured from the same material as the roof panels.
- 5.3.9.4. Inside closures shall be 18 gauge metal.
- 5.4. Standing Seam Roof - Architectural Panel Type - SS216 and SuperLok (Machine Seamed)**
- 5.4.1. Panel Description
- 5.4.1.1. Standing Seam Roof Panels shall be UL-90 rated, roll-formed, 24 or 22 gauge Galvalume, whether Galvalume Plus or pre-painted. Galvalume sheet shall have a coating weight of .5 oz./sq. ft. with a minimum yield of 50 ksi and conform to ASTM-792. Pre-painted finish shall be a premium Fluoropon coating produced with either Kynar 500 or Hylar 5000 resins and have a full 20 year warranty.
- 5.4.1.2. Panels profiles shall be 2" inches high x 16" wide. Panel seam is 2" high. All panels shall be striated.
- 5.4.1.3. One side of the panel shall be female in configuration, which will have factory applied hot melt mastic (see 5.4.5) inside the female seam. The female side will fit over the male side and be continuously locked together by an electrically powered mechanical seamer.
- 5.4.1.4. Maximum panel length shall be no more than 45'-0" unless otherwise discussed and approved by the PORTLAND SYSTEMS sales or manufacturing manager.
- 5.4.2. Endlaps
- 5.4.2.1. Endlaps shall have pre-punched holes in panels and a 16 gauge backup plate for proper placement of fasteners.
- 5.4.2.2. Mastic (see 5.4.5) shall be applied between the panels and secured with # 14 x 1" Long Life self drilling fasteners with sealing washer, through the upper panel, mastic lower panel and backup plate to form a compression joint.
- 5.4.2.3. Endlaps and eaves shall be the only places in the roof system where through-the-roof exposed fasteners will be used inside the building envelope.
- 5.4.3. Fasteners
- 5.4.3.1. Eave - #12 x 1" long life self drilling with sealing washer.
- 5.4.3.2. Endlaps - #14 x 1 1/4" long life self drilling with sealing washer.
- 5.4.3.3. Ridge - #14 x 7/8" Lap Tek long life self -drilling with sealing washer.
- 5.4.3.4. Clips to purlin - #12 x 1" Tek 2 self-drilling with Hex Head nut without washer.
- 5.4.3.5. Clips to bar joists - #12-24 x 1 1/4" Tek 4.5 self-drilling with Hex Head nut with washer.
- 5.4.3.6. Long Life fasteners, where exposed, either self-drilling or self-tapping, utilizing corrosion resistant head with an extended long life warranty, are standard. These fasteners are recommended for use when using a Galvalume Plus roof panel
- 5.4.3.7. Special applications may require the use of other fastener types than what are listed above. Review Erection Manual.
- 5.4.4. Clips
- 5.4.4.1. All clips shall have factory applied mastic.
- 5.4.4.2. Fixed clips - shall be either 2 3/8" or 3" in height and are to be used with blanket insulation.
- 5.4.4.3. Floating clips - shall be either 2 3/8" or 3" in height and are to be used with blanket insulation.
- 5.4.5. Sealants And Closures
- 5.4.5.1. Factory applied sealant used in panel sidelaps shall be a hot melt, foamable mastic - Q41A.
- 5.4.5.2. Field applied sealant used at the endlaps, eave, ridge assembly, and gable flashings shall be 100% solids butyl-based elastomeric tape sealer, furnished in roll form or pre-cut to length.
- 5.4.5.3. Outside closures shall be manufactured from the same materials as the roof panels.

SECTION 6. MISCELLANEOUS MATERIAL SPECIFICATIONS

6.1. Fasteners

- 6.1.1. Structural Bolts: All bolts used in connections of secondary framing to primary framing shall be zinc plated ASTM A307 or ASTM A325 as required by design.
- 6.1.2. Fasteners for Roof Panels: All panels shall be attached to the secondary framing members by means of:
- Option #1: Self-drilling structural screws for roofs shall be carbon steel #12-14 x 1 1/4" Hex Washer Head, cadmium or zinc plated, with or without painted head, assembled with EPDM washer. These fasteners are applicable for use with fiberglass blanket insulation from 1" to 3" thick.
 - Option #2: Self-drilling structural screws shall be carbon steel #12-14, 1-1/2" Hex Washer Head, cadmium or zinc plated, with or without painted head, assembled with EPDM washer. These fasteners are applicable for use with fiberglass blanket insulation from 3 1/2" to 6" thick.
 - Option #3: Self-tapping screws shall be #14 x 3/4" type "A" or "AB", zinc plated, painted or plain head assembled with a bonded or separate EPDM washer. These fasteners are applicable for use with fiberglass blanket insulation from 1" to 3" thick. Longer lengths are available. Pre-drilling is required.
 - Option #4: Optional Long Life fastener, in either self-tapping or self-drilling fasteners. Recommended when using Galvalume Plus panels.
- 6.1.3. Fasteners for Roof Panel Sidelaps are as follows:
- Option #1: Self-drilling - #14 x 7/8" Lap Tek zinc plated, painted or plain head assembled with sealing washer.
 - Option #2: Above fasteners in a Long Life finish, either in self-drilling or self-tapping. Corrosion resistant head with a long life extended warranty. These fasteners are recommended when using Galvalume Plus panels.
 - Option #3: Self-tapping - #14 x 3/4" type "A" or "AB" zinc plated, paint ad or plain head assembled with sealing washer.
- 6.1.4. Fasteners for the Standing Seam Roof Panels and clips: See Sections 5.3.7 and 5.4.3.
- 6.1.5. Fasteners for Wall Panels: All "R", "PBR", "A" and "AM" Panels shall be attached to the secondary framing members by means of:
- Option #1: Self-drilling fasteners of carbon steel #12 x 1" without washers as herein described for fiberglass insulation up to 3" thick and #12 x 1 1/2" for fiberglass insulation 3" to 6" thick.
 - Option #2: Corrosion resistant type Long Life fasteners with sealing washers, either self-tapping or self-drilling, as herein described.
 - Option #3: Self-tapping #14x3/4" carbon steel fasteners as herein described. These fasteners are applicable with fiberglass insulation up to 3" thick. #14, 1-1/2" fasteners are required for 3" to 6" thick insulation. Pre-drilling is required.
- 6.1.6. Fasteners for Wall Panel Sidelaps:
- Option #1: Self-drilling - #14 x 7/8" carbon steel screws as herein described.
 - Option #2: Corrosion resistant type Long Life fasteners with sealing washers, either self-drilling or self-tapping, as herein described.
 - Option #3: Self-tapping-#14 x 3/4" carbon steel screws as herein described. Pre-drilling is required.
- 6.1.7. Blind Rivets: All blind rivets shall be 1/8" diameter, high strength stainless steel pull rivet Type ADH.
- 6.1.8. Fasteners for "Retro R" Panel are as follows: Roof & wall sidelaps - self-tapping fasteners shall be # 14 x 3/4" Type "A" Long Life corrosion resistant plain or painted head with a bonded EPDM washer. Also available is a 3/16" TLR rivet, with a bonded EPDM washer. Pre-drilling of panel sidelaps will required. These will also be used at the roof eave, endlap, ridge, and at intermediate ribs. If being used as a wall panel, the fasteners would be used at wall base, eave, endlap, and intermediate ribs. See Erection Manual for locations.
- 6.2. Sealants And Closures**
- 6.2.1. Closure Strips: the corrugations of the roof and wall panels shall be filled with solid or closed cell, performed rubber, neoprene or polyethylene closures along the eave, ridge rake or base when required for weather tightness.
- 6.2.2. Standing Seam Roof Closures: See Sections 5.3.9 and 5.4.5.
- 6.2.3. Sealants: Roof panels shall be sealed with 3/32" x 3/8" wide tape sealant. The material shall be a Butyl base elastic compound with a minimum solid content of 99%, Schnee-Moorehead #522 or equal. The sealant shall have good adhesion to metal and be non-staining, non-corrosive, non-shrinking, non-oxidizing, non-toxic and non-volatile. The service temperature shall be from -60F to +300F. Optional 3/32" x 1" tape is available.
- 6.2.4. Standing Seam Sealant: See Sections 5.3.9 & 5.4.5.
- 6.2.5. Caulk: All gutter and downspout joints, rake flashing laps, ridge flashing laps, doors, windows, and louvers shall be sealed with white, burnished slate, or gray pigmented caulk of butyl rubber base, or clear silicone.
- 6.3. Gutter, Flashing And Downspouts**

- 6.3.1. Gutters and Flashing: All standard exterior gutters are 26 gauge Galvalume Plus steel or with painted finish in standard colors. Standard rake flashing is 26 gauge Galvalume Plus steel or with painted finish in standard colors.
- 6.3.2. Downspouts: All downspouts shall be 26 gauge Galvalume steel, rectangular in shape.

6.4. Flashing And Trim

- 6.4.1. Flashing at the rake (parallel to roof panels) and high eave shall not compromise the integrity of the roof system by constricting movement due to thermal expansion and contraction.
- 6.4.2. All flashing shall be manufactured from Galvalume steel, whether pre-painted or Galvalume Plus .

SECTION 7. PAINTING

7.1. Painting

- 7.1.1. All uncoated structural steel shall be cleaned of all foreign matter and loose scale in accordance with SSPC-2 and given a one mil coat of red oxide primer. Primer shall be applied by the use of airless handguns. Primer generally meets or exceeds the performance requirements of Federal Specification TT-P-636D.
- 7.1.2. Light gauge steel members shall be shot blasted and pre-coated with one coat of red oxide primer. Some hand sprayed shop touch-up may be employed.
- 7.1.3. Abrasions caused by handling after painting are to be expected. Primer shall be furnished to touch-up or field painting as specified in the contract documents.

7.2. Painted Steel Panels

- 7.2.1. Base metal shall be 29, 26, 24, or 22 gauge Galvalume steel.
- 7.2.2. Prime Coat: The base metal shall be pre-treated and then primed with an epoxy type primer for superior adhesion and superior resistance to corrosion. See paint film properties chart on following pages.

SECTION 8. ACCESSORIES

8.1. Windows

- 8.1.1. Standard Windows shall be horizontal slide units, polished aluminum finish 3'-0" x 3'-0", 4'-0" x 3'-0", 6'-0" x 3'-0". Glazing will be DSB or optional 7/16" thick hermetically sealed insulated glass. They shall be furnished complete with hardware, and half screen. Windows shall be self-flashing to wall panels. They shall be certified by Architectural Aluminum Manufacturers Association for performance requirements of ANSI/AAMA 101-85.
- 8.1.2. Slim-Line windows are 2'-0" wide x 7'-0" high with a bronze frame finish. These windows are self-framing to the wall
- 8.1.3. Panel.
- 8.1.4. Bronze frame finish is available in sliding windows. All windows are available with insulated and/or bronze glass.

8.2. Personnel Doors

- 8.2.1. Standard personnel doors shall be 3'-0", 4'-0" and 6'-0" x 7'-0" x 1 3/4" manufactured from 20 gauge galvanized steel. Door shall have square edges for non-handed installation. Door shall have an embossed finish with a white or bronze prime coat. Doors shall be flush and have vertical mechanical interlocking seams on both hinge and lock edges. Doors shall be provided with top and bottom inverted 16 gauge galvanized steel channels spot welded within the door. Doors shall be reinforced, stiffened, and sound deadened with resin impregnated kraft fiber honeycomb core with a nominal 1" cell size. Honey comb core shall completely fill the inside faces of the door and be laminated to the inside faces of the panels by means of moisture resistant, contact type adhesive. Doors shall be reinforced for applicable hardware. Doors shall be solid, half glass, or side vision (narrow lite). All glazing shall be done in the field. Glass is not provided by PORTLAND SYSTEMS.
- 8.2.2. Door frames shall be 16 gauge galvanized steel, pre-painted white. Door jambs shall be constructed for non-hand installation. Door frames shall have optional head and jamb flashing and optional weather strip. Door frames shall be provided with 1-1/2 pair of 4-1/2" x 4-1/2" hinges and reversible ANSI strike plate. Doors and frames shall be reinforced with 7 gauge hinge reinforcements.
- 8.2.3. Standard cylindrical lever locksets (levers both sides) shall meet ANSI #A1 56.2, Series 4000, Grade 2. The lockset elected by owner should be chosen in accordance with all current federal, state and local laws for the type of access required and the nature of use of the building.
- 8.2.4. Door threshold shall be aluminum, supplied with flat head fasteners and expansion shields for attachment to masonry Floor.

8.3. Overhead Door Framing

- 8.3.1. Overhead door support framing shall be designed to resist applicable wind loads and shall consist of channel jambs with a structural header at the top of the opening. Twenty-six gauge galvanized steel flashing, color coordinated, will be provided to conceal panel edges and fully wrap around the framing members opening unless otherwise specified.

8.4. Gravity Ridge Ventilators

- 8.4.1. Gravity ridge ventilators shall be manufactured from galvanized steel and painted white. The ventilator body shall be 26 gauge and the skirt shall match the roof slope. Chain operated damper will be furnished when specified. Ventilators shall be equipped with standard bird screens and riveted end caps. Ventilators shall be 10' long and have 9" throat. Twelve inch throat ventilators are available as an option.

8.5. Louvers

- 8.5.1. Standard Louvers shall have a 26 gauge galvanized steel frame, painted, with 26 gauge blades. Heavy Duty Louver frames shall be 18 gauge galvanized steel frame, painted, with 20 gauge blades. Both Standard and Heavy Duty louvers shall be self-framing and self flashing. They shall be equipped with adjustable or fixed blades as specified. Nominal sizes shall be 2'-0" x 2'-0", 3'-0" x 2'-0", 3'-0" x 3'-0" 4'-0" x 3'-0", and 3'-0" x 4'-0".

8.6. Skylights

- 8.6.1. High strength translucent panels are glass fiber reinforced polyester, high strength and may be either:
- a. Type I, structural (general purpose) conforming to commercial standard CS-214-57, or
 - b. Type II, having a burn rate of 2" per minute or less when tested in accordance with UL R3870SA.
- 8.6.2. High strength translucent panels match standard panel profiles, are 1/16" thick, weigh 8 ounces per square foot, and are white with a granitized top surface.
- 8.6.3. Insulated translucent panels are available in type I, "R" panel and standing seam profiles only.

SECTION 9. ERECTION AND INSTALLATION

9.1. Erection and Installation

- 9.1.1. The erection of the PORTLAND SYSTEMS building system shall be performed by a qualified erector, using proper tools and equipment. Erector shall follow good, sound, safe procedures and guidelines in accordance with any applicable federal, state or local laws.
- 9.1.2. It shall be the responsibility of the erector to comply with all appropriate legal and safety requirements.

SECTION 10. BUILDING ANCHORAGE AND FOUNDATIONS

10.1. Building Anchorage and Foundations

- 10.1.1. The building anchor bolts shall be designed to resist the maximum column reactions resulting from the specified combinations of loadings. These designs and sizes shall be specified by PORTLAND SYSTEMS. Anchor bolts will be supplied by the contractor and NOT by PORTLAND SYSTEMS.
- 10.1.2. Foundations shall be adequately designed by a qualified foundation engineer to support the building reactions and other loads which may be imposed by the building use. The design shall be based on the specific soil conditions of the building site. The foundation engineer shall be retained by other than the PORTLAND SYSTEMS. PORTLAND SYSTEMS assumes no responsibility for the integrity of the foundation.