

SECTION 13 34 19
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pre-engineered steel building primary and secondary framing.
- B. Metal wall panels, panel attachments, trim, and accessories.
- C. Metal roof panels, panel attachments, trim, and accessories.

1.2 RELATED SECTIONS

- A. Section 03 15 00- Placement of anchor bolt, leveling plates, grout.
- B. Section 03 30 00- Cast-in-place concrete.
- C. Section 05 21 00 - Steel joist framing.
- D. Section 05 31 00 - Steel decking.
- E. Section 08 31 00 - Overhead doors.
- F. Section 08 50 00 - Windows.
- G. Section 08 60 00 - Skylights, Translucent Panels, Wallights.
- H. Section 09 90 00 - Painting: Finish painting of primed steel surfaces.

1.3 DEFINITIONS

- A. Width – Distance measured from structural line to structural line and/or face of sidewall girt to face of sidewall girt.
- B. Length – Distance measured from structural line to structural line and/or face of endwall girt to face of endwall girt.
- C. Eave Height – Distance measured from the top of the eave member to the bottom of the primary frame base plate, or finish floor elevation when column base is above or below floor elevation.
- D. Bay Spacing/Interior Bay – Distance measured from centerline to centerline of the primary frames.
- E. Bay Spacing/End Bay – Distance measured from the face of the endwall girt to the centerline of the first interior primary frame.
- F. Roof Slope – Angle the roof surface makes with the horizontal. Roof slope limitations are given in the furnished table in conjunction with frame types and roof coverings.
- G. Dead Load – The weight of the metal building system supplied by manufacturer, such as roof, framing and covering members.

- H. Roof Live Load – The loads that are produced during maintenance by workers, equipment, and materials, and during the life of the structure by movable objects and do not include wind, snow, seismic, or dead loads.
- I. Floor Live Loads – Those loads induced on the floor system by the use and occupancy of the building.
- J. Roof Snow Load – The vertical load induced by the weight of snow, assumed to act on the horizontal projection on the roof of the structure.
- K. Wind Load – The load imposed on a structure by a given wind speed blowing from any horizontal direction.
- L. Auxiliary Load – The dynamic live loads which the structure must safely withstand, such as those induced by cranes and material handling systems.
- M. Collateral Load – The weight of additional permanent loads, including provision for future loads, specified in the order documents, other than the metal building system, such as sprinklers, mechanical and electrical systems, ceilings, and partitions.
- N. Seismic Load – The assumed loading acting in both the horizontal and vertical direction on the structural system due to the action of earthquakes.

1.4 REFERENCES

- A. AISC 360 - Specification for Structural Steel Buildings; 2005.
- B. AISC Steel Design Guide Series 3 - Serviceability Design Considerations for Low-Rise Buildings Second Edition; 2003.
- C. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2001 Edition with the 2004 Supplement.
- D. ASTM A 6/A 6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2008.
- E. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.
- F. ASTM A 108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2007.
- G. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.
- H. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.
- I. ASTM A194/A 194M - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both; 2009.
- J. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength; 2007b.
- K. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2009.

- L. ASTM A 475 - Standard Specification for Zinc-Coated Steel Wire Strand; 2003.
- M. ASTM A 490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated 150 ksi Minimum Tensile Strength; 2008b.
- N. ASTM A 500/A 500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2007.
- O. ASTM A 501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2007.
- P. ASTM A 529/A 529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2005.
- Q. ASTM A 563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a.
- R. ASTM A 568/A 568M - Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for; 2007a.
- S. ASTM A 572/A 572M - Standard Specification for High Strength Low-Alloy Columbium-Vanadium Structural Steel; 2007.
- T. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2007.
- U. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55 Percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2006a.
- V. ASTM A 924/A 924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process; 2007.
- W. ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2007a.
- X. ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability; 2008.
- Y. ASTM A 1039/A 1039M – Standard Specification for Steel, Hot Rolled, Carbon, Commercial, Structural, and High-Strength Low-Alloy, Produced by Twin-Roll Casting Process; 2009.
- Z. ASTM A 1063/A 1063M – Standard Specification for Steel Sheet, Twin-Roll Cast, Zinc-Coated (Galvanized) by the Hot-Dip Process; 2009.
- AA. ASTM C 991 - Standard Specification for Flexible Glass Fiber Insulation for Metal Buildings; 2008.
- BB. ASTM D 1494 - Standard Test Method for Diffuse Light Transmission Factor of Reinforced Plastic Panels; 1997(Reapproved 2008).
- CC. ASTM E 1514 - Standard Specification for Structural Standing Seam Steel Roof Panel Systems; 1998 (Reapproved 2003).

- DD. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; 2005.
- EE. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference; 1995 (Reapproved 2003).
- FF. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems; 1995 (Reapproved 2003).
- GG. AWS A2.4 - Standard Welding Symbols; 2007.
- HH. AWS D1.1/D1.1M - Structural Welding Code Steel; 2008.
- II. AWS D1.3 - Structural Welding Code Sheet Steel; 2007.
- JJ. IAS AC472 – International Accreditation Service, Inc., Accreditation Criteria for the Inspection Programs for Manufacturers of Metal Building Systems.
- KK. MBMA (LR) - Metal Building Systems Manual; 2006.
- LL. NAIMA 202 - Standard for Flexible Fiberglass Insulation Systems in Metal Buildings; 1996 (Rev. 2000).
- MM. SJI (SPEC) - Catalog of Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders; 2005.
- NN. SSPC-SP 2 - Specification for Hand Tool Cleaning; 1982 (Ed. 2004).
- OO. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; 2006.
- PP. USACE CECS-07416 - Structural Standing Seam Metal Roof (SSSMR) Systems; current edition.

1.5 DESIGN REQUIREMENTS

- A. The building shall be designed as a complete system. All components of the system shall be supplied or specified by the same manufacturer.
- B. Design Code –Design criteria shall be the system of designing the primary, primary endwall and secondary framing systems for the loads as specified in the [Choose an item.](#), and in general conformance with the MBMA Building Systems Manual.
 - 1. Occupancy Category
- C. Design Loads:
 - 1. Dead Load – Weight of the building system as determined by manufacturer.
 - 2. Roof Live Load – [Choose an item.](#)
 - 3. Collateral Load – [Choose an item.](#)
 - 4. Ground Snow Load – [Choose an item.](#)
 - 5. Roof Snow Load – [Choose an item.](#)
 - 6. Wind Load - [Choose an item.](#)
 - 7. Seismic Load – [Choose an item.](#)
 - 8. Floor Load.
 - a. Live Load – input psf.
 - b. Dead Load – input psf.
 - c. Collateral Load – input psf.

- D. Deflection Requirements shall be in accordance with the applicable provisions of the AISC Steel Design Guide Series 3 – Serviceability Design Considerations for Low-Rise Buildings.
- E. Deflection Requirements – The vertical deflection limit shall be determined from the controlling load combination using a snow load with a 50-year mean-recurrence interval or the code required live load. The horizontal drift and deflections limits shall be determined from the loads induced by a basic wind speed corresponding to a 10 year mean-recurrence interval.
 - 1. Vertical Deflections
 - a. Roof Panels – Choose an item.
 - b. Purlins – Choose an item.
 - c. Rafters – Choose an item.
 - d. Floor Joists and Beams – Choose an item.
 - e. Lintel Beams supporting Brick – Choose an item.
 - 2. Horizontal Deflections
 - a. Wall Panels – Choose an item.
 - b. Girts Choose an item.
 - c. Wind Beams – Choose an item.
 - 3. Horizontal Drift of Frames - Choose an item.
- F. Roof assembly shall permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of Choose an item.
- G. Roof assembly shall have a class 90 wind uplift rating by Underwriters Laboratories when tested in accordance with test procedure UL 580.

1.6 SUBMITTALS

- A. Design Certification shall be a letter certifying that the building conforms to the order documents. The letter shall be signed and sealed by a registered engineer in the project state.
- B. Design Calculations, Drawings, and Documents shall contain the information requested for permits and approvals and sufficient information for building erection and are furnished as stipulated in the order documents.
- C. Submit anchor bolt placement plan and column reactions in advance of erection drawings. The manufacturer shall not be responsible for the design of the foundation.
- D. Shop or Erection Drawings – Submit drawings indicating building dimensions, locations and sizes of structural members, connections, attachments, openings, wall and roof system details, anchor bolt placement, reactions, and general construction details.

1.7 QUALITY ASSURANCE

- A. The manufacturing company shall be certified for Parts A, B, and C of the IAS AC472, Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems.
- B. Manufacturer shall be a company with at least 10 years experience specializing in the design and fabrication of metal building systems and a member of the Metal Building Manufacturer's Association (MBMA).
- C. All structural framing and covering shall be the design of a licensed Professional Engineer experienced in the design of metal building systems.

- D. Erector shall have specialized experience in the erection of metal building systems for a period of at least 3 years.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. All materials shall be unloaded, handled, hauled and delivered to storage by competent workmen in a manner that will prevent bends, dents, scratches or other damage.
- B. All materials shall be properly stored and protected from weather damage.
- C. Upon receipt, all bundles of primed material shall be stored on blocking at an angle sufficient to allow any trapped water to drain and should be protected from the weather by covers allowing air circulation.
- D. Water, ice and snow should not be allowed to collect and remain thereon.
- E. The panel bundles shall be elevated and sloped in a manner to allow moisture to drain.

1.9 WARRANTY

- A. Building System Warranty
 - 1. Furnish manufacturer's standard warranty for the metal building system, excluding paint.
 - 2. The manufacturer shall warranty the metal building system against failure due to defective material or workmanship for a period of one (1) year from date of shipment.
 - 3. The liability under this warranty shall be limited to furnishing, but not dismantling or installing, necessary replacement material F.O.B. manufacturer's plant. In no event shall the manufacturer be liable for loss of profits, or other incidental, consequential, or special damages.
- B. Roof and Wall Panel Finish Warranty
 - 1. Paint systems
 - a. Furnish manufacturer's standard warranty for the metal panel paint system against chipping, peeling, blistering, fading in excess of 5 NBS Hunter units, and chalking in excess of 8 units as set forth in ASTM D4214.
 - b. The warranty shall be for a period of 35 years from the date of shipment for fluoropolymer paint systems.
 - c. The warranty shall be for a period of 25 years from the date of shipment for silicone-polyester paint systems.
 - 2. Zinc-Aluminum systems
 - a. Furnish manufacturer's standard warranty for the zinc-aluminum hot-dipped alloy-coated panels against roof and rupture, structural failure, or perforation due to normal atmospheric conditions.
 - b. The warranty shall be for a period of 20 years from the date of shipment for zinc-aluminum systems.
 - 3. The liability under this warranty shall be limited to furnishing, but not dismantling or installing, necessary replacement material F.O.B. manufacturer's plant. In no event shall the manufacturer be liable for loss of profits, or other incidental, consequential, or special damages.
- C. Roof System Weathertightness Warranty
 - 1. Furnish manufacturer's [Choose an item.](#) warranty for the metal building roof system. The warranty period is for 20 years from the final inspection and acceptance from the manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturers
 - 1. Kirby Building Systems; <http://www.kirbybuildingsystems.com/>.
- B. Substitutions - Not Permitted

2.2 METAL BUILDING SYSTEM

- A. Bay Spacing - [Choose an item.](#)
- B. Eave Height - [Choose an item.](#)
- C. Roof Slope - [Choose an item.](#)

2.3 PRIMARY FRAMING

- A. Includes the transverse rigid frames, lean-to rafters and columns, canopy rafter, interior columns, and/or other types of main load carrying interior structural members.
 - 1. Framing System Type - [Choose an item.](#)
 - 2. The framing system shall be manufactured of solid web members.
 - 3. Exterior column Shape - [Choose an item.](#)
 - 4. Interior column Type - [Choose an item.](#)
 - 5. Primary Framing Materials
 - a. Structural flat plate, strip and/or bar stock generally shall be of material based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M or ASTM A 572/A 572M as applicable and shall have a minimum yield strength of 55,000 psi.
 - b. W, M, and S shapes, angles, channels and other hot-rolled shapes shall be of material based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M, ASTM A 572/A 572M or ASTM A 36/A 36M as applicable and shall have minimum yield strengths 50,000 psi or 36,000 psi.
 - c. Other yield strength materials may be used based on the particular building design requirements.
 - d. Members fabricated from plate or bar stock materials shall have flanges and webs joined on one side of the web by a continuous process fillet weld.
 - e. Pipe and tube sections shall be of material based on the requirements of ASTM A 500/A 500M Grade B.

2.4 ENDWALL FRAMING

- A. Includes the corner columns, endwall columns, and endwall rafters, and/or other types of main load carrying endwall structural members.
 - 1. Framing System Type - [Choose an item.](#)
 - 2. Endwall Framing Materials
 - a. Hot rolled framing materials shall be composed of the materials and shapes specified in the primary framing material section.
 - b. Cold-form members shall be fabricated of material based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M or ASTM A 572/A 572M as applicable, and shall have a minimum yield strength of 55,000 psi.

2.5 SECONDARY FRAMING

- A. Secondary framing shall be the structural members that carry the loads to the primary framing systems, and shall include the eave struts, purlins, girts, and other miscellaneous structural members.
1. Secondary framing shall be manufactured of cold-formed light gauge sections, welded plate sections, structural sections, and/or open web members.
 2. Eave Struts shall be nominal 6 inches, 8 inches, 9.5 inches or 12 inches deep "cee" shaped members; and shall be manufactured of 12 through 16 gauge steel; and shall be designed as simple span for the specified loads.
 3. Purlins and girts shall be nominal 6 inches, 8 inches, 9.5 inches, or 12 inches deep "zee" shaped members; and shall be manufactured of 12 through 16 gauge steel designed simple span and/or continuous span for the specified loads.
 4. Secondary Framing Materials
 - a. Hot rolled framing materials shall be composed of the materials and shapes specified in the primary framing material section.
 - b. Cold-form members shall be fabricated of material based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M or ASTM A 572/A as applicable, and shall have a minimum yield strength of 55,000 psi.
 5. Kirby ClearBay™ roof joist system.
 - a. Open web, parallel chord, simple span load carrying members suitable for the direct support of roof systems utilizing material sizes and yield strengths as required.
 - b. Bridging - [Choose an item.](#)
 - c. Joist shall be bolted to the frames. (HINT: WELDED JOIST CONNECTIONS ARE AVAILABLE IF DESIRED FOR USE WITH WELDED BRIDGING)
 - d. Open web members shall be fabricated of material that conforms to the material specifications designated by the Steel Joist Institute as acceptable for this product.

2.6 MISCELLANEOUS FRAMING

- A. Miscellaneous Members shall typically be those members to augment the primary, primary endwall and secondary framing systems. They shall include members such as base angles, flange braces, jambs, headers, and bridging or sag members, and shall be designed to be supportive of the framing systems using manufacturer's standard design and fabrication procedures.
1. Base Angles:
 - a. Cold-formed steel angle 3 inches by 2 inches by 14 gauge, 55,000 psi minimum yield.
 - b. Anchored to slab or other collateral construction at 4 feet maximum centers and within 12 inches of any end with power driven fasteners or other secure methods not provided by building manufacturer.
 2. Flange Braces:
 - a. Cold-form angles fabricated of material based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M or ASTM A 572/A as applicable, and shall have a minimum yield strength of 55,000 psi.
 - b. For large columns and rafters, angles based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M, ASTM A 572/A 572M or ASTM A 36/A 36M as applicable and shall have minimum yield strengths 50,000 psi or 36,000 psi.
 - c. Attach flange brace to the purlin and/or girt and a clip on the interior flange of the primary framing system.

2.7 BRACING

- A. Bracing for lateral loads (wind, seismic, etc.) shall be a system of diagonal, portal, fixed base, torsional and/or diaphragm bracing designed for the specified loads in accordance with manufacturer's design practices.
- B. Materials used in the fabrication of bracing systems shall be designed utilizing manufacturer's standard practices, generally in compliance with the applicable sections of AISC and AISI.
 - 1. Structural flat plate, strip and/or bar stock generally shall be of material based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M or ASTM A 572/A 572M as applicable and shall have a minimum yield strength of 55,000 psi.
 - 2. W, M, and S shapes, angles, rods, channels and other hot-rolled shapes shall be of material based on the requirements of ASTM A 1008/A 1008M, ASTM A 1011/A 1011M, ASTM A 572/A 572M or ASTM A 36/A 36M as applicable and shall have minimum yield strengths of 50,000 psi or 36,000 psi.
 - 3. Cables shall be ASTM A 475, 7 strand, extra-high strength material, 1/4 inch diameter minimum.

2.8 ROOF SYSTEMS

- A. Roof systems typically consist of the roof panels, their attachments, trim and sealants used on the exterior of the roof.
- B. Roof Panels
 - 1. KirbyRibII roof panels providing a 36 inches wide net covering, having 1.25 inches high major ribs at 12 inches centers and two minor ribs between the major ribs.
 - a. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M or ASTM A 1063/A 1063M as applicable.
 - b. Minimum yield strength shall be 80,000 psi.
 - c. Sidelaps shall be one full major rib and shall utilize the bearing edge of the underlying major rib for support.
 - d. Panels shall be continuous from ridge to eave until panel length exceeds 41 feet, in which case endlaps are provided. Endlaps shall be 6 inches and occur over a supporting member.
 - e. Panel thickness - [Choose an item.](#)
 - f. Panel exterior finish and color - [Choose an item.](#)
 - g. Panel interior shall be precoated with a 0.5 mil minimum polyester wash coat.
 - 2. Kirby-Lok roof panels providing 24 inches net coverage with a 3 inch trapezoidal rib on each side and installed utilizing concealed floating clips. The standard panel shall have three minor ribs in the flat of the panel.
 - a. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M or ASTM A 1063/A 1063M as applicable.
 - b. Minimum yield strength shall be 50,000 psi.
 - c. Sidelaps shall contain factory applied mastic and shall [Choose an item.](#)
 - d. Panels shall be in lengths continuous from ridge to eave until the panel length exceeds 45.5 feet, in which case endlaps shall be provided. Endlaps shall be 6 inches and occur 12 inches above a supporting member. The endlap shall utilize a 16 gauge back-up plate.
 - e. Metal closures shall be used at the eave and ridge (high side of roof slope).
 - f. Panel thickness - [Choose an item.](#)
 - g. Panel exterior finish and color - [Choose an item.](#)
 - h. Panel interior shall be precoated with a 0.5 mil minimum polyester wash coat.
 - 3. Roof-Lok™ panels providing 16 inches net coverage with a 2 inch vertical rib on each side and installed utilizing concealed floating or fixed clips. The standard panel shall have striations in the flat of the panel to minimize oil canning.
 - a. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M or ASTM A 1063/A 1063M as applicable.

- b. Minimum yield strength shall be 50,000 psi.
 - c. Sidelaps contain factory-applied mastic and are locked together by an electrically powered seaming machine.
 - d. Panels shall be in lengths continuous from ridge to eave until panel length exceeds 45.5 feet, in which case endlaps shall be provided. Endlaps shall be 6 inches and occur 10 inches above a supporting member. The endlap shall utilize a 16 gauge back-up plate and shall be pre-punched for proper placement of fasteners.
 - e. Metal closures shall be used at the ridge (high side of roof slope).
 - f. Panel thickness - [Choose an item.](#)
 - g. Panel exterior finish and color - [Choose an item.](#)
 - h. Panel interior shall be precoated with a 0.5 mil minimum polyester wash coat.
- C. Roof Insulation
- 1. [Choose an item.](#)
 - 2. Thermal resistance of roof system – R Value = input.
 - 3. Nominal insulation density is in accordance with NAIMA 202.
- D. Trim shall be manufacturer's standard material yield strength and thickness and shall be compatible with the material, finish, and profile of the adjoining roof or wall system.

2.9 WALL SYSTEMS

- A. Wall systems typically consist of the wall panels, their attachments, and trim used on the exterior of the walls.
- B. Wall Panel Systems
- 1. KirbyWall System
 - a. Wall panels providing a 36 inches wide net coverage having 1-5/16 inches deep major ribs at 12 inches centers and one sculptured "valley" shape between major ribs.
 - b. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M or ASTM A 1063/A 1063M as applicable.
 - c. Minimum yield strength shall be 80,000 psi.
 - d. Sidelaps shall be one major rib.
 - e. Panels shall be continuous from eave to base until panel length exceeds 40 feet, in which case endlaps are provided. Endlaps shall be 4 inches and occur over a supporting member.
 - f. Panel thickness - [Choose an item.](#)
 - g. Panel exterior finish and color - [Choose an item.](#)
 - h. Panel interior shall be precoated with a 0.5 mil minimum polyester wash coat.
 - 2. KirbyRibII System
 - a. Wall panels providing a 36 inches wide net coverage having 1-1/4 inches high major ribs at 12 inches centers and two minor ribs between major ribs.
 - b. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M or ASTM A 1063/A 1063M as applicable.
 - c. Minimum yield strength shall be 80,000 psi.
 - d. Sidelaps shall be one major rib and shall utilize the bearing edge of the underlying major rib for support.
 - e. Panels shall be continuous from eave to base until panel length exceeds 40 feet, in which case endlaps are provided. Endlaps shall be 4 inches and occur over a supporting member.
 - f. Panel thickness - [Choose an item.](#)
 - g. Panel exterior finish and color - [Choose an item.](#)
 - h. Panel interior shall be precoated with a 0.5 mil minimum polyester wash coat.
 - 3. KRP System

- a. Wall panels providing a 36 inches wide net coverage having 1-1/4 inches deep major ribs at 12 inches centers and two minor ribs between major ribs.
 - b. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M or ASTM A 1063/A 1063M as applicable.
 - c. Minimum yield strength shall be 80,000 psi.
 - d. Sidelaps shall be one major rib.
 - e. Panels shall be continuous from eave to base until panel length exceeds 40 feet, in which case endlaps are provided. Endlaps shall be 4 inches and occur over a supporting member.
 - f. Panel thickness - [Choose an item.](#)
 - g. Panel exterior finish and color - [Choose an item.](#)
 - h. Panel interior shall be precoated with a 0.5 mil minimum polyester wash coat.
4. StuccoChoice wall panels providing a 16 inches wide net coverage having concealed fasteners and interlocking sidelaps.
- a. StuccoChoice panels shall be continuous from eave to base until panel length exceeds 24 feet, in which case trimmed panel joints are provided. Panel joints shall occur over a supporting member.
 - b. A 7/8 inches hat section will be provided for applications with insulation thickness less than 4 inches.
 - c. A 1-1/2 inches hat section will be provided for applications with insulation thickness equal to or greater than 4 inches.
 - d. Panel thickness - 20 ga.
 - e. Panel finish and color - [Choose an item.](#)
5. Insulation
- a. [Choose an item.](#)
 - b. Thermal resistance of wall system – R Value = input.
 - c. Nominal insulation density is in accordance with NAIMA 202.
6. Liner Panels
- a. Wall panels providing a 36 inches wide net coverage having 1-1/4 inches high major ribs at 12 inches centers and two minor ribs between major ribs.
 - b. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M or ASTM A 1063/A 1063M as applicable.
 - c. Minimum yield strength shall be 80,000 psi.
 - d. Sidelaps shall be one major rib and shall utilize the bearing edge of the underlying major rib for support.
 - e. Panels shall be continuous from eave to base until panel length exceeds 40 feet, in which case endlaps are provided. Endlaps shall be 4 inches and occur over a supporting member.
 - f. Panel thickness - [Choose an item.](#)
 - g. Panel exterior finish and color - Polar White silicone polyester.
 - h. Panel interior shall be precoated with a 0.5 mil minimum polyester wash coat.
7. Soffit Panels
- a. [Choose an item.](#)
 - b. Panel finish and color - [Choose an item.](#)
8. Trim shall be manufacturer's standard material yield strength and thickness and shall be compatible with the material, finish, and profile of the adjoining roof or wall system.
9. Framed openings in walls shall be an opening framed with 16 gauge minimum, cold-formed members, designed to meet specified loads. Openings shall be trimmed in accordance with manufacturer's standard practices.

C. Insulated Wall Panel Systems

1. Insulated Wall Panels shall be a system of wall panels with roll-formed exterior and interior faces chemically bonded to a continuously foamed-in place polyisocyanurate core.
2. Sheet steel shall be of material based on the requirements of ASTM A 653/A 653M, ASTM A 792/A 792M as applicable.

3. Minimum yield strength shall be 33,000 psi.
 4. Joint configuration shall be an offset tongue and groove with concealed fastener.
 5. Wall panels shall be rated with a Class 1 Fire Rating when tested in accordance with FM 4880.
 6. Trim shall be manufacturer's standard material yield strength and thickness and shall be compatible with the material, finish, and profile of the adjoining roof or wall system.
 7. Fluted Profile System
 - a. Panel Width – 42".
 - b. Panel Length – 8'-0" minimum to 56'-0" maximum.
 - c. Panel Thickness - [Choose an item.](#)
 - d. Thermal resistance of wall system – R Value = input when tested in accordance with ASTM C518.
 - e. Panel gauge – 26 exterior/26 interior.
 - f. Exterior panel finish and color - [Choose an item.](#)
 - g. Interior panel finish and color – Manufacturer's standard silicone polyester.
 8. Striated Profile System
 - a. Panel Width – 42".
 - b. Panel Length – 8'-0" minimum to 56'-0" maximum.
 - c. Panel Thickness - [Choose an item.](#)
 - d. Thermal resistance of wall system – R Value = input when tested in accordance with ASTM C518.
 - e. Panel gauge – 26 exterior/26 interior.
 - f. Exterior panel finish and color - [Choose an item.](#)
 - g. Interior panel finish and color – Manufacturer's standard silicone polyester.
 9. Architectural Profile System
 - a. Panel Width – 36".
 - b. Panel Length – 8'-0" minimum to 56'-0" maximum.
 - c. Panel Thickness - [Choose an item.](#)
 - d. Thermal resistance of wall system – R Value = input when tested in accordance with ASTM C518.
 - e. Panel gauge – 22 exterior/26 interior.
 - f. Exterior panel finish and color - [Choose an item.](#)
 - g. Interior panel finish and color – Manufacturer's standard silicone polyester.
- D. Fasteners for roof and wall covering systems shall typically be one or more types of self-drilling or self-tapping screws. Blind rivets shall typically be used in trim and accessory attachment or splicing. For application details, see manufacturer's erection documents.
- E. Systems covering sealants shall typically be preformed roll-tape sealants, tube sealants, and closures as required for weathertightness of the roof.
1. Sealants shall meet the FDA Regulations, as chemically acceptable to the U.S. Department of Agriculture for use in meat and poultry processing areas.
 2. Tape sealants shall be of preformed butyl rubber base, and shall typically be supplied as a 3/16 inch by 1/2 inch extruded shape as standard.
 3. Tube sealants shall be an acrylic or one part urethane base caulking material.
 4. Closures shall be of a closed cell foam material of a gray or neutral color, and shall be die cut to panel profiles.
 5. Closures shall be supplied as required to provide weathertightness.

2.10 FABRICATION

- A. Structural members shall typically be fabricated by shearing, flame cutting, forming, welding, punching, drilling, reaming, etc., as required in accordance with manufacturer's standard practices.
1. Welded plate members fabricated from plate or bar stock materials shall have flanges and webs joined on one side of the web by a continuous process fillet weld.

2. Shop connections shall typically be welded using either the submerged or the gas shielded arc process.
 3. Welding shall be in accordance with manufacturer's standard practices, and generally in compliance with the applicable sections, relating to design requirements and allowable stresses, of the "AWS Structural Welding Code - Steel".
 4. Field connections shall typically be by the bolting of structural members using high strength bolts and machine bolts in shop drilled, punched or reamed holes in accordance with manufacturer's standard practices.
 5. Workmanship/tolerance of the manufactured building parts shall be in accordance with the quality control standards of Kirby.
- B. Shop coating of members with shop primer shall be provided for the purpose of protecting the steel members during transportation, during proper and temporary jobsite storage, and during erection. Shop primer does not provide the appearance, durability and/or protection of an appropriate field applied finish.
1. Cleaning of steel members shall typically be the removal of oil, dirt, loose scale and/or foreign matter prior to painting in accordance with SSPC-SP2.
 2. Steel members shall receive one shop coat of manufacturer's standard primer with finish thickness of 1 mil.
 3. Primer Color - [Choose an item.](#)

2.11 ACCESSORIES

- A. Foundations and Anchor Bolts:
1. Foundation design, including anchor bolt lengths and anchorage into the concrete, shall be done by a Registered Professional Engineer experienced in the design of such structures.
 2. Anchor bolts shall not be less than the diameter or quantity shown on the metal building anchor bolt setting drawings.
- B. Bolts:
1. All primary bolted connections, as shown on drawings, shall be furnished with high strength bolts conforming to the physical specifications of ASTM A-325 or ASTM A-490.
 2. All high strength bolts shall be zinc plated with yellow dichromate coloring for easy identification. A-325 bolts are furnished without washers unless noted on the erection drawings, and must be tightened to a snug-tight condition unless otherwise noted on the erection drawings supplied for the project.
 3. All secondary bolted connections, unless noted otherwise and as shown on drawings, shall be furnished with high strength bolts conforming to the physical specifications of ASTM A-325 or shall be a "stud bolt" conforming to the physical specifications of ASTM A-449.
 4. All "stud bolts" shall be silver zinc plated. A-325 bolts and stud bolts are furnished without washers unless noted on the erection drawings.
- C. Translucent Roof Panels
1. Panel Type - [Choose an item.](#) Panel shall have a textured exterior surface, white finish, and conform to the configuration of the roof panels.
 2. UL Rating - [Choose an item.](#)
 3. Translucent roof panels are the same width as the roof panel and are compatible for use over two 5 feet purlin spaces.
 4. Translucent roof panels shall not be used as side-to-side nor end-to-end installations.
- D. Translucent Wall Panels
1. Panels shall be of nominal 8 ounces fiberglass having chopped strand reinforcing, textured exterior surface, white finish, and conform to the configuration of the wall

- panels, nominally 36 inches wide and generally supplied in lengths suitable for field cutting.
2. Translucent wall panels may be used as side-to-side installations.
- E. Mini-Ridge Ventilator
1. Ventilator shall have a 9 inches by 23 inches throat with a cord operated damper and a birdscreen.
 2. Ventilators color and finish - [Choose an item.](#)
 3. The base rating shall be 583 cubic feet per minute at 5 miles per hour, 20 degrees Fahrenheit, 20 feet stack height.
- F. Continuous or Sectional Ridge Gravity Ventilator
1. Ventilator shall have a 9 inches by 10 feet throat with a cord operated damper and a birdscreen.
 2. Ventilator color and finish – [Choose an item.](#)
 3. The 10 feet sectional vents are such that continuous runs of ridge vents can be field assembled.
 4. The base rating shall be 9 inches by 10 feet section vent is 2,170 cubic feet per minute at 5 miles per hour, 20 degrees Fahrenheit, 20 feet stack height.
- G. Roof Curb Units
1. Curb units shall be fabricated, from zinc-aluminum coated sheet steel, to the size opening specified.
 2. Units shall have endcaps that match the high rib of the roof panel.
 3. Standard sub-frame shall be minimum 16 gauge steel "zee" or "cee" sections.
 4. All fasteners and sealants required for installation shall be furnished by metal building manufacturer.
- H. Pipe Flashing Units
1. Units shall be for the flashing of plumbing vent stacks and/or other pipe-like roof penetrations.
 2. Base shall be neoprene with lead ring to be field configured to fit roof panel.
 3. Boot shall be neoprene.
- I. Doors (Field Assembled)
1. Manufacturer's standard field assembled doors with sandwich-construction door leaf fabricated of 20 gauge G60 galvanized steel sheets and filled with rigid foam insulating material. Glass and glazing are not included.
 2. Size and Type - [Choose an item.](#)
 3. Size and Type - [Choose an item.](#)
 4. Color - [Choose an item.](#)
 5. Door frames shall be fabricated of galvanized G60 16 gauge steel painted to match door.
 6. Manufacturer to provide standard hardware [Choose an item.](#)
- J. Doors (Factory Assembled)
1. Manufacturer's standard field assembled doors with sandwich-construction door leaf fabricated of 20 gauge A60 galvanized steel sheets and filled with rigid foam insulating material. Glass and glazing are included.
 2. Size and Type - [Choose an item.](#)
 3. Size and Type - [Choose an item.](#)
 4. Color - [Choose an item.](#)
 5. Door frames shall be fabricated of galvanized A60 16 gauge steel painted to match door.
 6. Sub-frames (framed openings) shall be galvanized A60 16 gauge steel and made to match the depth and fabricated to meet the needs of the installed application.

7. Manufacturer to provide standard hardware [Choose an item.](#)
 8. Manufacturer also to provide additional hardware including kick plates, closers, mortise locksets, crash chains, ball bearing hinges with non-removable pins, panic devices as shown on door schedule.
- K. Windows (Self Flashing)
1. Manufacturer's standard aluminum frame construction windows with head, sill, and jamb fins of the configuration required for self-flashing and self-framing installation in wall panels.
 2. Size - [Choose an item.](#)
 3. Type - [Choose an item.](#)
 4. Glazing - [Choose an item.](#)
- L. Windows (Factory Assembled)
1. Manufacturer's factory assembled thermal break aluminum frame construction windows with head, sill, and jamb fins of the configuration required for self-flashing and self-framing installation in wall panels.
 2. Size - [Choose an item.](#)
 3. Type - [Choose an item.](#)
 4. Color and finish - [Choose an item.](#)
 5. Glazing – [Choose an item.](#)
- M. Adjustable Louvers:
1. Shop fabricated 18 gauge galvanized steel, self-framing, self-flashing welded frames with 20 gauge galvanized blades and painted bronze.
 2. Louvers shall have a minimum free air flow area of 65 percent.
 3. Louvers shall have exterior mounted removable birdscreens.
 4. Adjustable louvers shall be equipped with a hand crank and a spring loaded closure system for optional operation by pull chain.
- N. Canopies:
1. Shall typically be an overhang provided with a roof finish and trim finish matching that of the main structure.
 2. Soffit panels are [Choose an item.](#)
 3. Canopies shall be framed of cold-formed light gauge shapes, welded built-up sections, hot-rolled sections and/or open web members at manufacturer's preference.
- O. Facades:
1. Facades shall typically be constructed of cold-formed secondary framing members and built-up or hot-rolled frames. Provide internal guttering for any closed façade systems.
 2. Facade system - [Choose an item.](#)
 3. Depth of façade system measured from face of wall girt is input.
 4. Height of façade measured vertically from structural line to structural line is input.
 5. Façade facing panel - [Choose an item.](#)
 6. Facade soffit panels - [Choose an item.](#)

PART 3 EXECUTION

3.1 INSTALLATION

- A. The erection of the building system shall be performed by a qualified erector, in accordance with the appropriate erection drawings, erection guides and/or other documents furnished by manufacturer, using proper tools, equipment and safety practices.

- B. Erection practices shall conform to "Common Industry Practices", Section 6, MBMA (LR) - Building Systems Manual.
- C. It shall be the erector's responsibility to comply with all appropriate legal and safety requirements.
- D. It shall be the erector's responsibility to determine and provide any and all temporary bracing, shoring, blocking, bridging, and/or securing of components, etc., as required during erection of the building.
 - 1. This temporary bracing, et al shall also be sufficient to secure the structural framing during erection against loads, such as wind and seismic, comparable in intensity to those for which the completed structure is designed.
- E. Field connections shall be bolted (unless otherwise noted).
- F. All bolted connections shall be tightened to a snug-tight condition unless otherwise noted on the building drawings supplied for the project.
- G. There shall be no field modifications to primary structural members except as authorized and specified by manufacturer.

END OF SECTION