



USA

UNITED STRUCTURES OF AMERICA
I N C O R P O R A T E D

SPECIFICATIONS

Section 13120

PRE-ENGINEERED METAL BUILDING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal Building System:
 - 1. Structural steel framing system.
 - 2. Metal roof system.
 - 3. Metal wall system.
 - 4. Roof and wall insulation systems.

1.2 REFERENCE STANDARDS

- A. American Institute of Steel Construction (AISC):
 - 1. AISC S326 Specifications for the Design, Fabrication and Erection of Structural Steel Buildings. (Allowable Stress Design)
- B. American Iron and Steel Institute (AISI):
 - 1. AISI – 01 Specification for the Design of Cold-Formed Structural Steel
- C. American Welding Society (AWS):
 - 1. AWS D1.1 Structural Welding Code-Steel (Latest Edition Unless Noted)
- D. ASTM International (ASTM):
 - 1. ASTM A36/A572/A992 Structural Steel Shapes
 - 2. ASTM A653 Steel Sheet, Zinc-Coated (G-90 Galvanized) by Hot-Dip Process, Structural (Physical) Quality.
 - 3. ASTM A475 Extra High Strength Grade Cable.
 - 4. ASTM A529 High-Strength Structural Steel Flat Bars
 - 5. ASTM A1011 SS/HSLAS Cold-Formed Structural Shapes
 - 6. ASTM A792 SS Steel Sheet (For Cladding Panels), Aluminum-Zinc Alloy Coated by Hot-Dip Process
 - 7. ASTM A53/A500, Gr B Hollow Structural Shapes
 - 8. ASTM A307 Common Bolts
 - 9. ASTM A325/A490 High Strength Bolts
 - 10. ASTM B117 Salt Spray (Fog) Testing
 - 11. ASTM D523 Specular Gloss
 - 12. ASTM D4214 Evaporating Degree of Chalking of Exterior Paints
 - 13. ASTM D968 Abrasion Resistance of Organic Coatings by Falling Abrasive
 - 14. ASTM D2244 Calculation of Color Differences from Instrumentally Measured Color Coordinates
 - 15. ASTM D2247 Testing Water Resistance of Coatings in 100% Relative Humidity

- E. Metal Building Manufacturers Association (MBMA)
 - 1. MBMA-01 Low Rise Building Systems Manual
- F. Underwriters Laboratories, Inc. (UL)
 - 1. UL 580 Test for Uplift Resistance of Roof Assemblies
- G. Federal Specifications (FS)
 - 1. FS TT-P-664 Protective Coatings for Fabricated Structural Members.
- H. Steel Structures Painting Council (SSPC)
 - 1. SP-2 Hand Tool Cleaning
- I. FM Global:

1.3 SUBMITTALS

- A. Product Data: Submit metal building system manufacturer's product information, specifications, and installation instructions for building components and accessories.
- B. Erection Drawings: Submit metal building system manufacturer's erection drawings, including plans, elevations, sections, and details, indicating roof framing, transverse cross-sections, covering and trim details, and accessory installation details to clearly indicate proper assembly of building components.
- C. Certification: Submit written "Letter of Certification" prepared and signed by a Professional Engineer, registered to practice in _____ verifying that the metal building system design and metal roof system design (including panels, clips, and support system components) meet indicated loading requirements and codes of authorities having jurisdiction.
 - 1. Certification shall reference specific dead loads, live loads, snow loads, wind loads/speeds, tributary area load reductions (if applicable), concentrated loads, collateral loads, seismic loads, end-use categories, governing code bodies, including year, and load applications.
- D. Submit certification verifying that the metal roof system has been tested and approved by Underwriter's Laboratory as Class 90 or;
- E. Submit certification verifying that the metal roof system has been tested and approved by Factory Mutual as Class _____.
- F. Warranty Documentation: Submit manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Manufacturer regularly engaged, for past 10 years, in manufacture of metal building systems of similar type to that specified.
 - 2. Accredited based on IAS Accreditation Criteria AC472 and requirements in International Building Code (IBC), Chapter 17.
- B. Installer's Qualifications:
 - 1. Installer regularly engaged, for past 5 years, in installation of metal building systems of similar type to that specified.

2. Employ persons trained for installation of metal building systems.

C. Certificate of design and manufacturing conformance:

1. Refer to Submittals article of this specification section.

D. Material Test Reports:

1. In addition to material certifications of structural steel, metal building system manufacturer shall provide, upon request at time of order, evidence of compliance with specifications through testing.
2. This quality assurance testing shall include testing of structural bolts, nuts, screw fasteners, mastics, and metal coatings (primers, metallic coated products, and painted coil products).

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:

1. Store and handle materials in accordance with manufacturer's instructions.
2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
3. Do not store materials directly on ground.
4. Store materials on flat, level surface, raised above ground, with adequate support to prevent sagging.
5. Protect materials and finish during storage, handling, and installation to prevent damage.

1.6 WARRANTY

A. Class I Weathertightness Warranty (Available only on Standing Seam Roof Panels)

1. This is U.S.A.'s standard limited liability weathertightness warranty which covers only panel seams and endlaps.
2. Liability, as combined to U.S.A. and our customer, is limited to \$0.10 per square foot of roof area (not building footprint).

B. Class II Weathertightness Warranty (Available only on Standing Seam Roof Panels)

1. This is U.S.A.'s standard no dollar limit weathertightness warranty which covers only panel seams and endlaps.
2. Although the warranty has no dollar limit it does not cover the entire roof system and roof system components – only panel seams and endlaps.
3. Liability, as combined to U.S.A. and our customer is limited to the actual cost of the repair work.

C. Class III Weathertightness Warranty (Available only on Standing Seam Roof Panels)

1. This is U.S.A.'s standard no dollar limit weathertightness warranty which covers the entire roof system.
2. Although the warranty covers the entire roof system there are provisions in the warranty which exclude any roof accessories which are not supplied by U.S.A. U.S.A cannot be liable for the products which are placed on the roof without having strict requirements and

guidelines for installation of such accessories. Therefore, if this warranty is required U.S.A. must supply all required roof accessories in order to investigate claims associated with deficiencies in these areas.

3. Liability, as combined to U.S.A. and our customer is limited to the actual cost of the repair work.

D. One Year Workmanship Warranty

1. This warranty provides additional reassurance that U.S.A. stands behind our products warranting the workmanship of the materials manufactured by U.S.A. for a period of one year from date of substantial completion.
2. This warranty is supplied at no cost to our customer.

E. Finish Warranties

1. These warranties are “pass through” warranties in that U.S.A. is only able to supply these because the raw material manufacturer (steel mill) or coil paint manufacturer (Akzo Nobel) is willing to warrant their product to this extent.
2. U.S.A. does not typically extend these warranties beyond what the steel mill or Akzo Nobel allows as U.S.A. cannot accept sole liability beyond their standard limits.
3. These warranties are supplied at no cost to our customer.

1.7 MANUFACTURER

United Structures of America, Inc. 1912 Buschong St. Houston, TX 77039.
214 Fountain Head Road, Portland, TN 37148

Phone (281) 442-8247. www.usabldg.com

1.8 BUILDING DESCRIPTION

- A. Building Dimensions: Indicated on the Drawings.
1. Horizontal Dimensions: Measure to inside face of wall sheets.
 2. Eave Height: Measure from top of finished floor to intersection of insides of roof and sidewall sheets.
 3. Clear Height Between Finished Floor and Bottom of Roof Steel: Indicated on the Drawings.
- B. Primary Structural Members:
1. Primary Framing System: USA, Inc. framing system as specified in this specification section.
 2. Frames: Welded-up plate section or structural wide flange columns and roof beams, complete with necessary splice plates for bolted field assembly as specified in this specification section.
 3. Bolts for Field Assembly of Primary Steel: High-strength A325 plain (black) bolts as indicated on erection drawings of metal building system manufacturer.

4. Beam and Post Endwall Frames: Endwall corner posts, endwall roof beams, and endwall posts as required by design criteria.
5. Exterior Columns: Welded-up "H" sections or cold-formed "C" sections.
6. Interior Columns: "H" sections, pipe or tube columns.
7. Connection of Primary Structural Members: ASTM A 325 plain (black) bolts through factory-punched holes.
8. Primary Structural Members: Paint with metal building system manufacturer's standard primer with surface preparation as specified in this specification section.

C. Secondary Structural Members:

1. Secondary Framing System: USA, Inc. framing system as specified in this specification section.
2. C/Z Purlins and Girts:

D. Metal Roof System: USA Inc. metal roof system as specified in this specification section.

E. Metal Wall System: USA Inc. metal wall system as specified in this specification section.

F. Where metal panels are required to be painted, use coating system as specified in this specification section.

1.9 DESIGN LOADS

A. Governing Design Code:

1. Structural design for the building structural system shall be provided by the metal building system manufacturer for the following design criteria:
 - a. Governing Building Code: _____.
 - b. Year/Version: _____.
 - c. Occupancy Category: _____.

B. Roof Live Load:

1. Roof live loads are loads produced during the life of the structure by moveable objects.
2. Wind, snow, seismic, or dead loads are not live loads.
3. Roof live loads are applied based on the Tributary Area as follows:
 - a. 0 to 200 Square Feet: _____ psf.
 - b. 201 to 600 Square Feet: Interpolation between 200 sq ft and 600 sq ft numbers.
 - c. 601 Square Feet or Greater: _____ psf.

C. Roof Snow Load:

1. Roof snow load used for designing the structure shall not be reduced and shall be the product of the following criteria:
 - a. Snow Load Coefficient (C_e): _____.
 - b. Thermal Factor (C_t): _____.
 - c. Snow Importance Factor (I): _____.
 - d. Ground Snow Load (P_g): _____.
 - e. Roof Snow Load (P_f): _____ psf.
2. Design snow load shall include the effects of minimum flat roof load limits, rain on snow, drifting snow, and unbalanced snow load as defined in the governing building code specified above.

D. Wind Load:

1. Wind load used for designing the structure shall be the product of the following criteria:
 - a. Wind Exposure Category: _____.
 - b. Wind Velocity Pressure Exposure Coefficient (K_z): _____.
 - c. Wind Topographic Factor (K_{zt}): _____.
 - d. Wind Directionality Factor (K_d): _____.
 - e. Wind Velocity (V), miles per hour: _____.
 - f. Wind Importance Factor (I_w): _____.
 - g. Building Wind Load (q_z): _____ psf.
2. Wind Pressure Coefficients and the design pressures shall be applied in accordance with the governing code.

E. Seismic Load:

1. Seismic load used for designing the structure shall be based on the following criteria:
 - a. Spectral response acceleration for short periods (S_s): _____ % g.
 - b. Spectral response acceleration for 1-sec. period (S_1): _____ % g.
 - c. Site Class: _____.
 - d. Seismic Importance Factor (I): _____.
2. Seismic loads shall be applied in accordance with the governing code.

F. Dead Load: Dead load shall consist of the weight of building system construction, such as roof, framing, and covering members.

G. Collateral Load:

1. Collateral load in pounds per square foot shall be applied to the entire structure to account for the weight of additional permanent materials other than the building system, such as sprinklers, mechanical systems, electrical systems, hung partitions, and ceilings.
2. This allowance does not include the weight of hung equipment weighing 50 pounds or more.
3. Equipment loads of 50 pounds or more shall be indicated on the Drawings and the structure shall be strengthened as required.
4. Architect will provide the metal building system manufacturer with the magnitude and approximate location of concentrated loads greater than 50 pounds before design of the building starts.

H. Auxiliary Loads: Auxiliary loads shall include dynamic loads, such as cranes and material handling systems, and will be defined in the Contract Documents.

I. Crane Loads:

1. Crane loads shall be a function of the Service Class as defined by the governing code and Crane Manufacturers Association of America (CMAA) and the rated tonnage (A- Standby or Infrequent service, B- Light service, C- Moderate service, D- Heavy Service, E- Severe Service, F- Continuous Severe Service).
2. Cranes in Service Class E or F shall be in accordance with AISE 13.
 - a. Service Class of Crane: _____.
 - b. Deflection Criterion for Crane: _____.
3. Crane loads will be obtained from the crane manufacturer and supplied by the Architect to the metal building system manufacturer at the time of bid.
4. Building structure shall be designed for the crane loads in accordance with the governing code.
5. Multiple cranes in the same bay or aisle shall be designed in accordance with the governing code.

6. If the governing code does not address multiple crane design practices, MBMA Metal Building Systems Manual shall be used.

J. Load Combinations: Load combinations used to design primary and secondary structural members shall be in accordance with the governing code.

1.10 DEFLECTIONS

A. Structural Members:

1. Maximum deflection of main framing members shall not exceed $1/\underline{\hspace{2cm}}$ of their respective spans.
2. Maximum deflection due to snow load in roof panels and purlins shall not exceed $1/\underline{\hspace{2cm}}$ of their respective spans.
3. Maximum deflection due to wind load in wall panels and girts shall not exceed $1/\underline{\hspace{2cm}}$ of their respective spans.

B. Lateral deflections, or drift, at the roof level of the structure in relation to the floor or slab on grade, caused by deflection of horizontal force resisting elements, shall not exceed $H/\underline{\hspace{2cm}}$.

C. Calculations for deflections shall be done using only the bare frame method.

1. Reductions based on engineering judgment using the assumed composite stiffness of the building envelope shall not be allowed.
2. Drift shall be in accordance with AISC Serviceability Design Considerations for Low-Rise Buildings.
3. Use of composite stiffness for deflection calculations is permitted only when actual calculations for the stiffness are included with the design for the specific project.
4. When maximum deflections are specified, calculations shall be included in the design data.

PART 2 PRODUCTS

2.1 STRUCTURAL STEEL FRAMING SYSTEM

A. General:

1. Design of Structural System: Clear or multi-span rigid frame with tapered or straight columns and roof beams, with gable or single-slope roof.
2. Actual Building Length:
 - a. Structural line to structural line.
 - b. Same as nominal; i.e., number of bays times length of bays.
 - c. Structural Line: Defined as inside face of wall sheets.
3. Actual Building Width:
 - a. Structural line to structural line.
 - b. Nominal building width.
4. Minimum Roof Slope: $\underline{\hspace{2cm}}$ inch in 12 inches.
5. Maximum Roof Slope: $\underline{\hspace{2cm}}$ inch in 12 inches.
6. Components and Parts of Structural System:
 - a. Indicated on the Drawings or the Specifications.
 - b. Clearly marked.
 - c. Erection Drawings: Supply for identification and assembly of parts.
 - d. Drawings: Carry stamp of a registered professional engineer.

7. Foundations:
 - a. Foundations, Including Anchor Bolt Embedment Length: Properly designed by qualified engineer, retained by other than metal building system manufacturer, in accordance with specific soil conditions for building site.
 - b. Reactions for Proper Design of Foundations: Supplied by metal building system manufacturer.
 - c. Anchor Bolts:
 - 1) Anchor Bolt Diameter: Indicated on anchor bolt layout drawings furnished by metal building system manufacturer.
 - 2) Anchor Bolts: Supplied by Contractor, not metal building system manufacturer.
 - 3) Anchor Bolts on Moment-Resisting Column Bases: Nuts above and below base plates.

B. Structural Steel Design:

1. Structural Mill Sections or Welded-up Plate Sections: Design in accordance with AISC Specification for Structural Steel Buildings.
2. Cold-Formed Steel Structural Members: Design in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
3. Structural System: Design in accordance with specified building code (Refer to Design Loads and Building Codes).

C. Primary Framing:

1. Rigid Frames:
 - a. Frames: Welded-up plate section columns and roof beams, complete with necessary splice plates for bolted field assembly.
 - 1) Base Plates, Cap Plates, Compression Splice Plates, and Stiffener Plates: Factory welded into place and connection holes factory fabricated.
 - 2) Columns and Roof Beams: Fabricated complete with holes in webs and flanges for attachment of secondary structural members and bracing, except for fieldwork as noted on erection drawings furnished by metal building system manufacturer.
 - b. Bolts for Field Assembly of Frame Members: ASTM A 325 high-strength bolts as indicated on erection drawings furnished by metal building system manufacturer.
2. Endwall Structural Members: Cold-formed channel members designed in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members or welded-up plate sections designed in accordance with AISC Specification for Structural Steel Buildings.
 - a. Endwall Frames: Endwall corner posts, endwall roof beams, and endwall posts as required by design criteria.
 - 1) Splice Plates and Base Clips: Shop fabricated complete with bolt connection holes.
 - 2) Base Plates, Cap Plates, Compression Splice Plates, and Stiffener Plates: Factory welded into place and connection holes shop fabricated.
 - 3) Beams and Posts: Factory fabricated complete with holes for attachment of secondary structural members, except for field work as noted on erection drawings furnished by metal building system manufacturer.
 - b. Intermediate Frames: Substituted for end-wall roof beams, when specified.
 - 1) Factory fabricate necessary endwall posts and holes for connection to intermediate frame used in endwall.

D. Secondary Structural Members:

1. Purlins:
 - a. Purlins:
 - 1) "Z"-shaped, precision-roll-formed, in different gauges to meet specified loading conditions.
 - 2) 8-inch, 10-inch, or 12-inch-deep "Z" sections.
 - b. Attach purlins to main frames and endwalls with ½-inch-diameter bolts.
 - c. Brace purlins at intervals indicated on erection drawings furnished by metal building system manufacturer.
 - d. Concentrated Loads: Hung at purlin panel points.
2. Eave Members:
 - a. Eave Struts: Factory punched, 8-inch, 10-inch, or 12-inch-deep "C" sections, precision-roll-formed, in different gauges to meet specified loading conditions.
3. Girts:
 - a. "Z" or "C"-shaped, precision-roll-formed, in different gauges to meet specified loading conditions.
 - b. 8-inch, 10-inch, or 12-inch-deep "Z" or "C" sections.
4. Bracing:
 - a. Locate bracing as indicated on the Drawings.
 - b. Diagonal Bracing:
 - 1) Cable Bracing conforming to ASTM A475-78 for extra high strength grade or
 - 2) Structural Angle Bracing or
 - 3) Hot-rolled rods of sizes indicated on the Drawings.
 - 4) Attach to columns and roof beams as indicated on the Drawings.
 - c. Optional fixed-base wind posts or pinned-base portal frames may be substituted as required.
 - d. Flange Braces and Purlin Braces: Cold formed and installed as indicated on the Drawings.

E. Welding:

1. Welding Procedures, Operator Qualifications, and Welding Quality Standards: AWS D1.1 - Structural Welding Code – Steel and AWS D1.3 - Structural Welding Code – Sheet Steel.
2. Welding inspection, other than visual inspection as defined by AWS D1.1, paragraph 6.9, shall be identified and negotiated before bidding.
3. Certification of Welder Qualification: Supply when requested.

F. Priming of Structural Steel Framing System:

1. General:
 - a. Structural Steel: Prime paint as temporary protection against ordinary atmospheric conditions.
 - b. Perform subsequent finish painting, if required, in field as specified in the painting section.
 - c. Before priming, clean steel of loose rust, loose mill scale, dirt, and other foreign materials.
 - d. Steel Fabricator: Not required to sand blast, flame clean, or pickle steel before painting, unless otherwise specified.
2. Primary Frames:
 - a. Clean steel in accordance with SSPC-SP2.
 - b. Factory cover steel with 1 coat of USA std. gray primer formulated to equal or exceed Federal Specification TTP-664
 - c. Minimum Dry Film Thickness: 1.0 mil.

3. Secondary Structural Members – Roll-Formed:
 - a. Pre-coated cold form material by commercial coater using a preparation process equal to SSPC-SP10.
 - b. Minimum Dry Film Thickness: 0.5 mil.

2.2 METAL ROOF SYSTEMS

- A. Roof covering shall consist of the roof panels, their attachments, trim and sealants for use on the exterior of the roof. They shall be either U.S.A. "PBR" or Standing Seam roof panels.
 1. U.S.A. "PBR" shall be a system of roof panels providing a 36" wide net coverage having 1 ¼" high major ribs at 12" centers and two minor ribs between the major ribs. Sidelaps shall be one full major rib and shall utilize the bearing edge of the underlying major rib for support. U.S.A. "PBR" panels shall be continuous from ridge to eave until panel length exceeds 40' and/or the panel becomes prohibitive of handling, in which case endlaps are provided. Endlaps shall be 6" and occur over a supporting member.
 2. U.S.A.'s Standing Seam roof panels consist of four types:
 - a. "GUARDIAN" shall be a system of standing seam roof panels with either a fixed clip system for rigid construction or a floating clip system to provide for thermal movement of the panel and have a roof slope of ¼:12 or greater. The 24" wide net coverage has 3" high major ribs at 24" centers, and 2 minor ribs between the major ribs. "GUARDIAN" roof system shall be installed utilizing concealed steel clips, snap-locked at the side joints and weatherproofed by factory applied sealant. "GUARDIAN" panels shall be continuous from ridge to eave until the panel length exceeds 40' and/or the panels become prohibitive for handling, in which case endlaps are provided. Endlaps shall be 3" and occur 7" above a supporting member, utilizing 16 gage back-up plates. For materials and properties. The "GUARDIAN" standing seam roof system shall be available for 3 different insulation conditions. The "UTILITY" system (fixed condition only) shall be for buildings without insulation up to 2" of blanket insulation and does not provide for clearance over the purlins. The "LOW" system shall be for buildings with no more than 4" of blanket insulation, but not requiring thermal blocks and will provide 3/8" of clearance over the purlins. The "HIGH" system shall be for buildings with more than 4" of blanket insulation that require thermal blocks and will provide 1 3/8" of clearance over the purlins.
 - b. "GUARDIAN-LOK" shall be a system of standing seam roof panels with a floating clip system to provide for thermal movement of the panel and have a roof slope of ¼:12 or greater. The 24" wide net coverage has 3" high major ribs at 24" centers, and 2 minor ribs between the major ribs (18" wide panel also available). "GUARDIAN-LOK" roof system shall be installed utilizing concealed steel clips, snap-locked at the side joints, weatherproofed by factory applied sealant and is mechanically seamed. "GUARDIAN-LOK" panels shall be continuous from ridge to eave until the panel length exceeds 40' and/or the panels become prohibitive for handling, in which case endlaps are provided. Endlaps shall be 3" and occur 7" above a supporting member, utilizing 16 gage back-up plates. The "GUARDIAN-LOK" standing seam roof system shall be available for different insulation conditions. The "LOW" system shall be for buildings with no more than 4" of blanket insulation, but not requiring thermal blocks and will provide 3/8" of clearance over the purlins. The "HIGH" system shall be for buildings with more than 4" of blanket insulation that require thermal blocks and will provide 1 3/8" of clearance over the purlins.
 - c. "SURE-LOK" shall be a system of standing seam roof panels with either a fixed clip system for rigid construction or a floating clip system to provide for thermal movement of the panel and have a roof slope of ½:12 or greater. The 16" wide net

coverage has a 2" vertical leg at 16" centers. "SURE-LOK" roof system shall be installed utilizing concealed steel clips, weatherproofed by factory applied sealant and is field seamed. "SURE-LOK" panels shall be continuous from ridge to eave until the panel length exceeds 40' and/or the panels become prohibitive for handling, in which case endlaps are provided. Endlaps shall be 3" and occur 7" above a supporting member, utilizing 16 gage back-up plates. The "SURE-LOK" standing seam roof system shall be available for 3 different insulation conditions. The "UTILITY" system (fixed condition only) shall be for buildings without insulation and does not provide for clearance over the purlins. The "LOW" system shall be for buildings with no more than 4" of blanket insulation, but not requiring thermal blocks and will provide 3/8" of clearance over the purlins. The "HIGH" system shall be for buildings with more than 4" of blanket insulation that require thermal blocks and will provide 1" of clearance over the purlins.

- d. "SUPREME-LOK" shall be a system of standing seam roof panels with either a fixed clip system for rigid construction or a floating clip system to provide for thermal movement of the panel and have a roof slope of 1/2:12 or greater. The 16" wide net coverage has a 2" vertical leg at 16" centers. "SUPREME-LOK" roof system shall be installed utilizing concealed steel clips, weatherproofed by factory applied sealant and is field seamed. "SUPREME-LOK" panels shall be continuous from ridge to eave until the panel length exceeds 40' and/or the panels become prohibitive for handling, in which case endlaps are provided. Endlaps shall be 3" and occur 7" above a supporting member, utilizing 16 gage back-up plates. The "SUPREME-LOK" standing seam roof system shall be available for 3 different insulation conditions. The "UTILITY" system (fixed condition only) shall be for buildings without insulation and does not provide for clearance over the purlins. The "LOW" system shall be for buildings with no more than 4" of blanket insulation, but not requiring thermal blocks and will provide 3/8" of clearance over the purlins. The "HIGH" system shall be for buildings with more than 4" of blanket insulation that require thermal blocks and will provide 1" of clearance over the purlins.

3. U.S.A.'S ROOF COVERING SYSTEMS are designed for 6" maximum blanket insulation thickness over the purlin. U.S.A. acknowledges that there are proprietary methods of insulating where insulation of greater than 4" between the purlins may be utilized.

2.3 METAL WALL SYSTEMS

- A. WALL COVERING shall consist of the wall panels, their attachments, and trim for use on the exterior of the walls. They shall be either U.S.A. "PBA" wall panels or U.S.A. "PBR" wall panels.
 4. U.S.A. "PBA" shall be a system of wall panels providing a 36" wide net coverage having 1 1/4" deep major ribs at 12" centers and one sculptured valley shape between major ribs. Sidelaps shall be one major rib and shall utilize the bearing edge of the underlying major rib for support. U.S.A. "PBA" panels shall be continuous from eave to sill until the panel length exceeds 25' and/or the panel becomes prohibitive of handling in which case endlaps are provided. Endlaps shall be 4" and occur over a supporting member.
 5. U.S.A. "PBR" shall be a system of wall panels providing a 36" wide net having 1 1/4" high major ribs at 12" centers and two minor ribs between the major ribs. Sidelaps shall be one major rib. U.S.A. "R" panels shall be continuous from eave to sill until the panel length exceeds 35' and/or the panel becomes prohibitive of handling in which case endlaps are provided. Endlaps shall be 4" and occur over a supporting member.

2.4 PANEL PROPERTIES

MATERIALS used in the fabrication of roof and wall coverings shall normally be in accordance with the table below.

ROOF AND WALL COVERINGS MATERIALS AND PROPERTIES

APPLICATION		ROOF				WALLS			
PANEL SYSTEM		"PBR"		"Standing Seam"		"PBA"		"R"	
Dimensions	Coverage	36"		Varies		36"		36"	
	Rib Height	1 1/4"		Varies		1 1/4"		1 1/4"	
Material		Steel		Steel		Steel		Steel	
Available Materials Gage		26 ga.	24 ga.	24 ga.	22 ga.*	26 ga.	24 ga.	26 ga.	24 ga.
Minimum Yield Strength		80 KSI	50 KSI	50 KSI	50 KSI	80 KSI	50 KSI	80 KSI	50 KSI
Applicable ASTM Specifications		A653		A653		A653		A653	
		A792		A792		A792		A792	
Available Surface Finishes		U.S.A. Standard Colors**		U.S.A. Standard Colors**		U.S.A. Standard Colors**		U.S.A. Standard Colors**	
		Zinc-Aluminum Coated		Zinc-Aluminum Coated		Zinc-Aluminum Coated		Zinc-Aluminum Coated	

* Denotes Special Order Item.

** Any Special Color Order Is Subject To Color Chip Match. Note: 26ga. trim material may have a yield strength of 50 ksi.

2.5 METAL COATING SYSTEM

COATINGS and FINISHES for roof and wall coverings and their flashings shall, unless otherwise specified, be of the materials and properties given in the table below.

COATINGS AND FINISHES MATERIALS AND PROPERTIES

DESIGNATION		U.S.A. COLOR FINISH	ZINC-ALUMINUM COATED
Front Surface	Material	White: Polyester Colors: UniCote 2000 (Silicone Polyester) Colors: UniCote 3000 Kynar 500 (Fluoropolymer)	Zinc-Aluminum Alloy
	Thickness	0.85-1.0 mil	.0008"
Back Surface	Material	Polyester Over Epoxy Primer	Zinc-Aluminum Alloy
	Thickness	0.5 mil	0.0008"
Substrate		Zinc-Aluminum Alloy	Steel See Section 3.1.3.

- A. ROOF PANELS shall normally be unfinished zinc-aluminum alloy coated steel or prefinished in a choice of U.S.A. Standard Color over zinc-aluminum alloy coated.
- B. WALL PANELS shall normally be prefinished in a choice of U.S.A. standard colors applied over zinc-aluminum alloy coated steel.
- C. TRIM shall normally be of 26 gage Grade D steel of 50,000 psi minimum yield strength and shall be compatible with the material, finish, and profile of the adjoining roof or wall system.
- D. SYSTEMS COVERING SEALANTS shall normally be pre-formed roll-tape sealants, tube sealants, and closures as required for weathertightness of the roof.
- E. TAPE SEALANTS shall be of preformed butyl rubber base, and shall normally be supplied as a 3/32" x 3/8" extruded shape. Wide tape sealant, 3/32" x 1" shall be available if specified.
- F. TUBE SEALANTS shall be a butyl rubber base caulking material.
- G. CLOSURES shall be of a closed cell foam material of a gray or neutral color, and shall be die cut to PBR or PBA panel profiles. Closures shall be supplied as required to provide weathertightness.

2.6 FASTENERS

- A. FASTENERS for roof and wall covering systems shall normally be one or more types of self-tapping (standard) or self-drilling (optional) screws as defined in the table below. Blind rivets shall normally be used in trim and accessory attachment and splicing. For application details see erection documents.

**TABLE OF COVERING FASTENER
TYPES AND PROPERTIES**

Type Designation		Std. Indented Head Self Tap	Zinc-Alum. Cap Self Tap	Std. Indented Head Self Drill	Zinc-Alum. Cap Self Tap	Blind Rivets	Washers
Material	Head Style	Plated Carbon Steel	Zinc Aluminum Cast	Plated Carbon Steel	Zinc Aluminum Cast	Aluminum Sleeve With Steel Mandrel	Domed Combination Steel And Neoprene
	Body Style	Plated Carbon Steel	Plated Carbon Steel	Plated Carbon Steel	Plated Carbon Steel		
Sizes*	Structural	#14x1" Thru 1 1/4"	#14x1" Thru 1 1/4"	#12x1 1/4" Thru 1 1/2"	#12x1 1/4" Thru 1 1/2"	1/8" x 1/4" (Nominal)	5/8" O.D.
	Stitch	#14x1"	#14x1"	#14x7/8"	#14x7/8"		
Average Strengths	Structural Pullout (14 gage)	1260# #8(.199") Drill	1260# #8(.199") Drill	415#	415#	Non-Structural Fasteners	As Contributed
	Stitch Pullout (26 gage)	370# w/o Washer 730# w/ Washer	520# w/o Washer 730# w/ Washer	375# w/ Washer	375# w/ Washer		
Washers Application		All	All	All	All	None Required	All Screws
Other Properties		5/16" Hex. Head Ext. Drive	5/16" Hex. Head Ext. Drive	5/16" Hex. Head Ext. Drive	5/16" Hex. Head Ext. Drive	Use Rivets For Trim Applications Only	Use With Self-Drill And Self Tap

- Long Structural Fasteners Will Be Required Depending Upon The Thickness Of the Insulation.

INSULATION (Available on request)

- A. Recommended insulation thickness available upon request.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine area to receive metal building system.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

3.2 ERECTION – STRUCTURAL STEEL FRAMING SYSTEM

- A. Erect structural steel framing system in accordance with the Drawings and metal building system manufacturer's erection drawings.
- B. Field Modifications:
 - 1. Require approval of metal building system manufacturer.
 - 2. Responsibility of building erector.
 - 3. Field Modifications to Truss Purlins: Not allowed, unless indicated on erection drawings furnished by metal building system manufacturer.
- C. Fixed Column Bases: Grout flush with floor line after structural steel erection is complete.

3.3 INSTALLATION – METAL ROOF SYSTEM

- A. Metal Roof System Installation:
 - 1. Install roof system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
 - 2. Install roof system weathertight.

3.4 INSTALLATION – METAL WALL SYSTEM

- A. Metal Wall System Installation:
 - 1. Install wall system in accordance with metal building system manufacturer's instructions at locations indicated on the Drawings.
 - 2. Install wall system weathertight.
 - 3. Verify structural system is plumb before wall panels are attached.
 - 4. Align and attach wall panels in accordance with erection drawings furnished by metal building system manufacturer.
 - 5. Install side laps with minimum of 1 full corrugation.
 - 6. Flashings, Trim, Closures, and Similar Items: Install as indicated on erection drawings furnished by metal building system manufacturer.

3.5 INSTALLATION – INSULATION

- A. Insulation Installation: Install insulation in accordance with manufacturer's instructions at locations indicated on the Drawings.

3.6 PROTECTION

- A. Protect installed metal building system to ensure that, except for normal weathering, metal building system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION