

## **DIVISION 13 – SPECIAL CONSTRUCTION**

### **SECTION 13122**

#### **METAL BUILDING SYSTEMS ROOF AND WALL PANELS**

##### **PART 1 GENERAL**

###### **1.1 SECTION INCLUDES**

- A. Clear span rigid frame.
- B. Bay spacing as shown on drawings.
- C. Roof slope: Pitch to match existing building.
- D. Primary framing: Rigid frame of rafter beams and columns, braced end frames, end wall columns.
- E. Secondary framing: Purlins, girts, eave struts, flange bracing and other items detailed.
- F. Lateral Bracing: Horizontal loads not resisted by mainframe action shall be resisted by rod in the sidewall.
- G. Wall and Roof System: (If provided by same manufacturer of the other framing components, if not, this item shall not apply): Preformed steel panels insulation, linear sheets and accessory components.
- H. Accessories: as required or shown in drawings.

###### **1.2 RELATED SECTIONS**

- A. Section 03300: Concrete, Footings, grade beams, and floor slab.
- B. Section 07210: Building Insulation.
- C. Section 07620: Sheet Metal Flashing and Trim.

###### **1.3 REFERENCES**

- A. AISI – Specification for the Design of Cold-Formed Steel Structural Members – 1996 Edition with 1999 Addendum.
- B. AISC – Specification for Structural Steel Buildings – Allowable Stress Design and Plastic Design, 1989.
- C. AISC – Steel Design Guide Series 3 – Serviceability Design Considerations for Low-Rise Buildings, 1990.
- D. ASTM A36 – Specification for Carbon Structural Steel, 2000.
- E. ASTM A123 – Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products, 2000.
- F. ASTM A153 – Specification for Zinc Coating (Hot Dip) on Iron and steel Hardware, 2000.
- G. ASTM A 307 – Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength, 2000.
- H. ASTM – A325 – Specification for Structural Bolts, Steel, Heat Treated, 120/105 Ksi Minimum Tensile Strength, 2000.
- I. ASTM A463 – Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process, 2000.
- J. ASTM A475 – Specification for Zinc-Coated Steel Wire Strand.
- K. ASTM A490 – Specification for Heat Treated Steel Structural Bolts, 150 Ksi Minimum Tensile Strength, 2000.
- L. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes, 1999.
- M. ASTM A501 – Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing, 1999.
- N. ASTM A529 – Specification for High-Strength Carbon-Manganese Steel of Structural Quality, 2000.
- O. ASTM A572 – Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel, 2000.
- P. ASTM A 653 – Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process, 2000.
- Q. ASTM A792 – Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process, 1999.
- R. ASTM A 1011 – Specification for Steel Sheet and Strip Hot Rolled Carbon, Structural High Strength Low – Alloy and High Strength Low-Alloy with Improved Formability, 2000.
- S. ASTM C665 – Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing, 1998.
- T. ASTM D1494 – Test Method for Diffused Light Transmission Factor of Reinforced Plastic Panels, 1997.
- U. ASTM E1514 – Specification for Structural Standing Seam Steel Roof panel Systems, 1998.
- V. ASTM E1592 - Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference, 1998
- W. ASTM E1646 – Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference, 1995.
- X. ASTM E1680 – Test Method of Rate of Air Leakage through Exterior metal Roof Panel Systems, 1995.
- Y. AWS A2.4 – Standard Welding Symbols, 1998.
- Z. AWS D1.1 – Structural Welding Code – Steel, 2000.
- AA. AWS D1.3 – Structural Welding Code – Sheet Steel, 1998.

- BB. MBMA Metal Building Systems Manual, 2002.
- CC. NAIMA 202 – Standard for Flexible Fiberglass Insulation Systems in Metal Buildings, 2000.
- DD. SJI (Steel Joist Institute) – Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders, 40<sup>th</sup> Edition, 1994.
- EE. SSPC (Society for Protective Coatings) – SP- 2- Specification for Hand Tool Cleaning, 1995 (Part of Steel Structures Painting Manual, Vol. Two)
- FF. SSPC – Paint 15 – Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Part of Steel Structures Painting Manual, Vol. Two)
- GG. SSPC – Paint 20 – Zinc Rich Primers (Type I, “Inorganic”, and Type II, “Organic”); Society for Protective Coatings; 1991 (Part of Steel Structures Painting Manual, Vol. Two).
- HH. UL 580 – Tests for Uplift Resistance of Roof Assemblies, 1994.

#### 1.4 DESIGN REQUIREMENTS

- A. The building shall be designed by the Manufacturer as a complete system. Members and connections not indicated on the drawings shall be the responsibility of the manufacturer and/or Contractor. All components of the system shall be supplied or specified by the same manufacturer.
- B. Design Code:  
Design load application shall be in accordance with SBCCI or an applicable national or local building code.
- C. Dead Loads:  
The dead load shall be the weight of the Metal building System and as determined by the system manufacturer.
- D. Collateral Loads:  
The collateral load shall be as determined by building manufacturer. Collateral loads shall not be applied to the roof panels.
- E. Live Loads:  
The building system shall be capable of supporting a minimum uniform live load of 420 psf., reducible.
- F. Wind Loads:  
The design wind speed for the metal building system shall be 100 mph or as defined on the contract documents.
- G. Seismic Loads:  
Seismic load shall be determined based upon a seismic zone factor Z/spectral response acceleration factors  $S_{ss}$  S1.
- H. Rainfall Intensity:  
All exterior gutters and downspouts shall be designed for rainfall intensity based upon a 5-year recurrence interval for a five-minute duration. All interior gutters, valleys and downspouts shall be designed for rainfall intensity based upon a 25-year recurrence interval based on a five-minute duration.
- I. 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, the specified building code.
- J. Site Conditions:  
The following site features and adjacent structures must be considered in the design. Building is 30 feet away from a 60 wide X 125 long X 30high adjacent building, as shown on drawings.

#### 1.5 SUBMITTALS

Note: All manufacture drawings and design calculations shall bear the professional seal and signature of a licensed professional engineer registered in the state of Louisiana.

- A. Submit anchor bolt placement plan, column reactions in advance of erection drawings.
- B. Product Data: Provide data on profiles, component dimensions, fasteners and color selection.
- C. Manufacturer’s Installation Instructions: Indicate preparation requirements and assembly sequence.
- D. Shop or Erection Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers, loads, wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, installation, framing anchor bolt settings, sizes and locations from datum, foundation loads, indicate field welded connections with AWS A2.4 welding symbols; indicate net weld lengths.

#### 1.6 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with MBMA Metal Building Systems Manual, and, for items not covered, AISC – Specification for Structural Steel Buildings.

#### 1.7 QUALIFICATIONS

A New FFA Conference Center  
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Project # 0225  
3.31.26

- A. Manufacturer: The company manufacturing the products specified in this Section shall have a minimum of ten (10) years experience in the manufacture of steel building systems.
- B. Structural framing and covering shall be the design of a licensed Professional Engineer experienced in design of this work.
- C. Erector shall have specialized experience in the erection of steel building systems for a period of at least ten (10) years.

#### 1.8 FIELD MEASUREMENTS

- A. Metal building contractor shall verify that field measurements are as indicated in contract on erection drawings.

#### 1.9 WARRANTY

- A. Building manufacturer shall provide manufacturer's standard material warranty.
- B. Metal building contractor shall provide a material and workmanship warranty of one (1) year.

#### 1.10 ADMINISTRATION

- A. All nomenclature shall conform to the MBMA Metal Building Systems Manual.
- B. Coordination and administration of the work shall be in accordance with the MBMA Metal Building Systems Manual – Common Industry Practices.

### PART 2: PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. American Building Company, Eufala Alabama
- B. Butler Metal Building Systems.
- C. Schulte Building Systems, Hockley, Texas.
- D. Alliance Steel, Inc.
- E. Star Building Systems, Division of Robertson-Ceco Corporation.
- F. American Steel Building Company, Inc.: Division of NCI Building Systems, LLP.
- G. Crown Metal Buildings, Inc.
- H. Garco Building Systems,
- I. Gulf States Manufacturers, Inc.
- J. Mesco Metal Buildings; Division of NCI Building Systems, LLP.
- K. Metallic Metal Building Co., Division of NCI Building Systems, LLP.
- L. Package Industries, Inc.
- M. Spirco Manufacturing; Division of Metal Building Products, Inc.
- N. Steelo Systems, Inc.
- O. United Structures of America, Inc.
- P. VP Buildings, Inc.; a United Dominion Co.
- Q. S & S Steel Building, Inc.
- R. Substitutions: Section 01001 Basic Requirements: 1.51 Substitutions

#### 2.02 MATERIALS – ROOF SYSTEMS AND WALL PANELS

(For the purposes of these specifications the performance specifications for steel Roof and Wall panels manufactured Schulte Building Systems are used. Equal products may be substituted upon approval by the Architect using the prior approval format outlined in these specifications.)

**For Horizontal Wall Panels: Panel Profile shall be "Standard M Panel" profile.**

**For Roof Panels: Panel Profile shall be "Standard PBR, 26 gauge Galvalume.**

- A. Roof and Wall Panel: Equal to Schulte Building Systems standard roof covering shall be nominal 26 gauge, "Schulte" PBU Panel, 36 inch steel panels or Equal.
- B. "Schulte Building Systems" 36-inch panel shall provide a 36-inch net coverage having 3/4-inch high major ribs at 6-inch centers or Equal.
- C. Roof panels shall have purlin bearing edge on one side of the bottom panel providing support for side lap seam when specified.
- D. Roof panel length shall extend from ridge to eave up to a maximum length of 35 ft.
- E. Roof and Wall panel end laps, when required, shall overlap 6 inches and occur over a supporting purlin.
- F. Ridge covering shall be die formed "Schulte Building Systems" panels or ridge roll formed from flat panels.
- G. Trim and flashings: Shall be fabricated from nominal 26 gauge (.019) steel sheet.

- H. Roof and Wall Insulation: ASTM C665 insulation shall be Vinyl faced 6 inch thick fiberglass blanket of .6 lb. Density installed over the girts and purlins, under the panels. UL flame spread classification of 25 or less where exposed shall apply. Insulation Support mesh shall be galvanized poultry netting and shall be provided in rolls for installation over the purlins and girts under the blanket insulation.
- I. Soffit Panels: Minimum gauge recommended by manufacturer.
- J. Closures: Manufacturer's standard type, closed cell or metal.
- K. Fasteners: ZAC type fastener to be used. Size and design to maintain load and weather tightness requirements.
- L. Sealant: Manufacturer's standard type.
- M. Exterior Surfaces of Roof Panels: Pre coated steel of silicone polyester (SMP) finish.
- N. Color: To be selected by Owner and Architect from full range of available manufacturer's colors meeting ASTM D 2244.
- O. Roof Coating: Prefinished Factory Color coatings for roof shall be in accordance with the technical specifications applicable to roof system.
  - a. Top Side: coating of prefinished panels shall be nominal one mil thickness.
  - b. Base Metal shall be pretreated with Bonderite 1303 manufactured by O.M. Parker.
  - c. Primer: Pigmented epoxy.
  - d. Finish Coat: Silicone polyester.
  - e. Bottom Side: Prefinished panels shall be nominal 0.5 mil thickness
  - f. Base Metal: Pretreated with Bonderite 1303.
  - g. Primer: White or Parchment epoxy pigment.
- P. Roof and Wall Panel Side and End Laps shall be sealed with field applied preformed roll-tape sealants, tube sealants and closures in accordance with Schulte Building Systems erection drawings.
  - 1. Tape Sealants shall be butyl rubber, acrylic or silicone base.
  - 2. Tube Sealants, unless specified shall be preformed butyl rubber base roll-tape 3/32 inch by 3/8 inch or 5/32 inch by 7/8 inch as required.
- Q. Quantity, Size, Location and Spacing of Screws and Rivets: In accordance with Schulte Building System's erection drawings.

## 2.03 MATERIAL - TRIM

- A. Flashings, Internal and External Corners, Closure Pieces, Fascia, Infills, Caps and other trim pieces shall be of same material and finish as adjacent material, profile and color as selected by Owner and Architect from Manufacturer's full range of available colors.
- B. Gauge: 26 ga. (.019 steel sheet).

## 2.04 FABRICATION – PRIMARY FRAMING

- A. Framing Members: Clean prepare in accordance with SSPC-SP2 as a minimum, and coat with building manufacturer's standard primer.
- B. Hot rolled members shall be fabricated in accordance with AISC Specification for pipe, tube, and rolled structural shapes and primed.
  - 1. Hot rolled steel strip, sheet, plate or bar stock used to fabricate primary structural framing shall conform to the physical requirements of ASTM A570, ASTM A572 or ASTM A36 modified, as applicable, shall have a minimum yield strength of 50,000 psi.
  - 2. Hot rolled structural shapes including W.M.S. and angles shall meet the physical requirements of ASTM A36 and shall have minimum yield strength of 36,000 psi.
- C. Cold Formed Members: fabricated from materials meeting the physical requirements of ASTM A570 and shall have a minimum yield strength of 55,000 psi.
- D. Rod Bracing: Fabricated from materials meeting the physical requirements of ASTM A36 modified to 50,000 psi minimum yield.
- E. Round Pipe Shapes: ASTM A53 Grade B, 36,000 psi minimum yield strength.
- F. Tube Shapes: ASTM A500 Grade B, 36,000 psi minimum yield strength.
- G. Hot Rolled Steel Sheets: ASTM A446 Grade D or E and shall be coated with zinc in accordance with ASTM A525 or zinc aluminum alloy in accordance with ASTM A-792-AZ55.
- H. Cable Bracing: ASTM A475-78 for extra high strength grade.

- I. Fabricate built-up members in accordance with MBMA Metal Building Systems Manual, Common Industry Practices.

## 2.05 FABRICATION – SECONDARY FRAMING

- A. Framing Members: Clean and prepare in accordance with SAPC-SP2, as a minimum and coat with building manufacturer's standard primer.
- B. Cold Formed Members: Cold formed structural shapes shall be fabricated in accordance with MBMA Metal Building Systems Manual, Common Industry Practices.
- C. Purlins and Girts shall be 8 inch x 2 ½ inch "Z" shaped members for bay spacing up to 30 ft., or 10 inch x 3 inch "C" shape members for bay spacing up to 35 ft. Material thickness is dependent upon the load criteria and shall vary from 16 to 12 gauge.
- D. Eave Struts: Shall be a light gage composite built up section, 8 inches or 10 inches deep, designed to interface the roof panels with the wall panels and to carry the strut loads of the bracing system.

## 2.06 FABRICATION – END WALL FRAMING

- A. Bearing Frame (BF) and end wall columns shall be fabricated from cold formed steel sheet, hot rolled structural shapes or "I" sections fabricated from flat steel sheet and bar stock.
- B. Rigid Frame (RF) end walls shall be used in lieu of Bearing Frame type if applicable.

## 2.07 FABRICATION – BRACING SYSTEM

- A. Diagonal Bracing: Shall be steel cables, rods or angles in accordance with metal building standard design practices.

## 2.08 FABRICATION – FIELD CONNECTIONS

- A. A325 bolts shall be installed by the "turn-of-nut" method in accordance with AISC "Specifications for Structural Joints Using ASTM A325 or A490 Bolts."
- B. Field Connections: For miscellaneous members shall be made with #12 self drilling screws, powder driven steel pins, bolts or expansion anchors as shown on erection drawings or called for by manufacturer.

## 2.09 FABRICATION – GUTTERS AND DOWNSPOUTS

- A. Fabricate gutters, downspouts and elbows from manufacturer's standard accessories for gutters and downspouts. Use nominal 26 gauge (.019) steel sheet or as recommended by manufacturer.
- B. Color to be selected by Owner and Architect from full range of manufacturer's available colors.
- C. Fabricate or furnish gutter support straps and downspout clips or support straps from manufacturer's standard material, design and finish.

# PART 3 EXECUTION

## 3.1 EXECUTION

- A. Verify site conditions under provisions of Section 01001.
- B. Verify that foundation, floor slab, mechanical and electrical utilities and placed anchors are in correct position and properly squared.
- C. Provide access to the work as scheduled for owner provided inspections, if required. The cost of any required inspections is the responsibility of the owner.
- D. Do not proceed until unsatisfactory conditions have been corrected.

## 3.2 ERECTION – FRAMING

- A. Erect framing in accordance with MBMA Metal Building Systems Manual, Common Industry Practices.
- B. Use templates for accurate setting of anchor bolts. Level bearing plate area with steel wedges or shims, and grout. Check all previously placed anchorages.
- C. Erect building frame true and level with vertical members plumb and bracing properly installed. Maintain structural stability of frame during erection.
- D. Ream holes requiring enlargements to admit bolts. Burned holes for bolted connections are not permitted without written approval by designer. Burned holes to be reamed.
- E. Tighten bolts and nuts in accordance with "Specification for structural joints using ASTM A325 or A490 bolts" using specified procedure. Snug tight or direct tension indicator washers may be used to assure correct tightening.

- F. The erector shall furnish temporary guys and bracing where needed for squaring, plumbing and securing the structural framing against loads, such as wind loads acting on the exposed framing and seismic forces, as well as loads due to erection and erection operation, but not including loads resulting from the performance of work by others. Bracing furnished by the manufacturer for the metal building system cannot be assumed to be adequate during erection and are not to be used to pull frames into plumb condition. The temporary guys, braces false works and cribbing are the property of the erector, and the erector shall remove them immediately upon completion of erection.
- G. Do not field cut or modify structural members without approval of the metal building manufacturer.
- H. After erection, erector to prime welds, abrasions and surfaces not shop primed or needing touch-up.

### 3.3 ERECTION – ROOFING SYSTEMS AND WALL PANEL COMPONENTS

- A. Install all roofing systems in accordance with manufacturer's instructions and details.
- B. Exercise care when cutting pre-finished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, using proper fasteners aligned level and plumb.
- D. Set purlins and girts at right angle and bolt to appropriate clips. Attach to clips as required to satisfy design loads and as shown on drawings.
- E. Place screw down roof panels at right angel to purlins and girts. Predrill panels. Lap panel ends as recommended by manufacturer on roof. Place end laps over purlins or girts. Apply butyl roof panel side and end lap sealant between panel ends and side laps to provide water-tight installation per details furnished.

### 3.4 ERECTION – GUTTER, DOWNSPOUT, FLASHINGS AND TRIM

- A. Install gutters and downspouts, flashings and trim in strict accordance with manufacturer's instructions, using proper sheet metal procedures.
- B. Install downspouts to utilize splash pads furnished by others.

### 3.5 INSTALLATION – ACCESSORIES

- A. Install all accessories in accordance with manufacturer's instructions.
- B. All roof accessories to be installed weathertight.

### 3.6 TOLERANCES

- A. All work shall be performed by experienced workmen in a workmanlike manner to published tolerances.
- B. Install framing in accordance with MBMA Metal Building Systems Manual, Common Industry Practices.

END OF SECTION - 13122