

# METAL BUILDING SPECIFICATIONS

## 1. GENERAL

### 1.1 Scope

The building shall include all structural frames and framing members, connection bolts wall and roof panels, skylights, windows, doors, ventilators, flashing, fasteners and all other items called for in the drawings and specifications which are pertinent to the basic steel structure.

### 1.2 Description

#### 1.2.1. Clear Span Buildings

"RF", buildings shall be of the single gable, rigid frame type. "SS" buildings shall be of the single-slope, rigid frame type. The primary transverse rigid frames shall be clear span. "RF Straight Column" shall have straight columns with tapered rafters. Secondary girt mount shall be either continuous by-pass mounted or simply supported flush mounted.

#### 1.2.2. Interior Support Buildings

"MS" buildings shall be of the single gable rigid frame type. The primary transverse frames shall be supported by intermediate columns. "MS Straight Column" shall be straight column with tapered rafters. Secondary girt mount shall be either continuous by-pass mounted or simply supported flush mounted.

### 1.3 Nomenclature

1.3.1. The building width and length shall be measured from the inside face to inside face of the wall covering.

1.3.2. The building eave height shall be measured from the bottom of the base plate of the extreme frame columns to the top of the eave strut.

1.3.3. The roof slope shall be a rise of 1 unit for each 12 units of horizontal projection, or shall be designed for any reasonable roof pitch.

1.3.4. The bay spacing between frame center lines shall be:

a. 20' or 25', or shall be designed for any reasonable bay spacing.

b. End bays are 1'-2" less in length than interior bays. End wall steel line extends 1'-2" beyond endwall rigid frame centerline.

c. Special bay spacing as specified.

### 1.4 Drawings

Complete erection drawings, anchor bolt setting plans, flashing details, and accessory installation details shall be furnished upon request with all parts clearly indicated with part marks for proper assembly. Those erecting building shall assume all responsibility for any deviation from the recommended erection instructions.

## 2. DESIGN

### 2.1 General

2.1.1. All structural steel sections and welded plate members shall be designed in accordance with the eighth or ninth as specified) edition of the AISC "Specifications for the Design, Fabrication, and Erection of Steel for Buildings".

2.1.2. All light gage cold formed, structural members shall be designed in accordance with the 1986 edition of the AISI "Specifications for the Design of Light Gage Cold-Formed Steel Structural Members".

### 2.2 Design Criteria

2.2.1. The roof dead load shall be assumed to be distributed uniformly over the entire roof area.

2.2.2. The application of the roof live load to roof covering secondary and primary framing shall be in accordance with the minimums allowed by the governing building code unless exceptions are specifically noted excluding tributary loading.

2.2.3. In the design of primary and secondary members, wind velocity pressure shall be applied as prescribed by the specified building code or as prescribed by the 1986 edition of the "Low Rise Building Systems Manual" as published by the Metal Building Manufacturers Association.

2.2.4. Magnitudes shall be as specified by local building codes or other governing bodies. In the absence of other specifications, the magnitude of the loads shall be as recommended by the "Low Rise Building Systems Manual" as published by the Metal Building Manufacturers Association.

2.2.5. All wall girts and roof purlins shall be designed as simple or continuous beams. Each interior rigid frame shall be designed to carry equal loads that result from a simple span purlin or girt system.

### 2.3 Design Load Combinations

2.3.1. Dead Load + Live Load (DL+LL)

2.3.2. Dead Load + Wind Load (DL+WL)

2.3.3. Dead Load + Snow Load (DL+SL)

2.3.4. Dead Load + Seismic Load (DL+SEIS)

2.3.5. Other load combinations shall be as recommended by the specified building code or by the "Low Rise Building Systems Manual" as published by the Metal Building Manufacturers Association.

### 2.4 Building Materials by Others

All building materials not provided by the building manufacturer shall be properly designed to sustain all loads imposed on them and to transfer those loads to the building manufacturer's primary framing system.

## 3 STRUCTURAL FRAMING

### 3.1. General

3.1.1. All framing members shall be shop fabricated for bolted field assembly.

#### 3.1.2. Nomenclature

a. Primary structural framing shall refer to the transverse rigid frames, lean-to rafter beams and columns, canopy beams, intermediate support columns and longitudinal wind bracing.

b. Secondary structural framing shall refer to purlins, girts, eave struts, flange bracing struts, tension rods, clips, etc.

3.1.3. All hot rolled steel sheet, plate, and strip shall have a minimum tested yield strength of 50,000 psi when used as flange material and web material. All strip for light gauge purlins and girts shall be 57,000 psi minimum tested yield strength. Hot rolled milled shapes shall have a minimum tested yield strength of 36,000 psi unless noted otherwise on the erection drawings.

3.1.4. All field connections shall be bolted. All bolts for secondary framing, light endwall frames, and endwall columns shall be a minimum of 1/2" diameter conforming to ASTM A-307 or ASTM A-325 as shown on the drawings. All bolts for primary structural members, excluding light endwall frames and endwall columns, shall be a minimum of 3/4" diameter conforming to ASTM A-325. A-325 bolts shall be tightened by the turn-of-the-nut method. All bolts, nuts and washers shall be unplated.

3.1.5. All framing members shall be marked for identification and erection.

### 3.2 Rigid Frames, Lean-To Frames, Canopy Beams

All members shall be mill sections or welded built up "I" shapes either constant depth or tapered. All flange-to-web welding for built-up sections shall be done by a submerged arc automatic welding process.

### 3.3 Purlins and Girts

Purlins and girts shall be roll-formed "Z" sections of a depth and gage as needed to conform to the particular design criteria.

### 3.4 Eave Struts

Eave struts shall be 8 inch deep by 5 inch bottom flange unsymmetrical "C" sections used to properly and adequately receive both the roof panels and wall panels and to serve as a compression member to transfer endwall wind loads.

### **3.5 Wind Bracing**

Wind bracing shall consist of cable in both the roof and sidewalls. The size and number of cables required shall depend on the amount of wind load to be transferred to the foundation. Wind bracing may also be provided by the diaphragm action of the roof and/or wall panels.

### **3.6 Flange Bracing**

The compression flange shall be laterally supported so that the allowable compressive stress is not exceeded.

### **3.7 Base Attachment**

The bottom off the wall panels shall be fastened to a base angle located on the floor slab.

### **3.8 Painting**

All structural framing members, which are not galvanized or otherwise coated, shall be cleaned and given one shop coat of primer. There shall be no finished paint applications. The primer shall be formulated to equal or exceed the end performance requirements of federal specification SSPC15-68T.

## **4. ROOF AND WALL COVERING**

### **4.1 General**

4.4.1. Roof covering shall be 26 or 24 gage galvalume, painted steel, ribbed panels.

4.4.2. Wall covering shall be 26 or 24 gage galvalume, painted steel, ribbed panels.

### **4.2 Panel Materials**

Material for galvanized steel panels shall be formed from flat coiled sheet and shall be galvanized with a zinc coating.

### **4.3 Panel Configuration**

4.3.1. Type "R" and "PBR" shall have 1-1/4" deep major ribs spaced 12" on center. The flat width between major ribs shall be stiffened by two minor ribs. Each panel shall have a 36" wide net coverage.

Application shall be accomplished with through panel fastening. "R" and "PBR" panels shall have a minimum tested yield strength of 80,000 psi. In addition, the "PBR" panel shall have a purlin bearing edge.

4.3.2. Type "A" architectural panel shall have 1-1/8" deep inverted ribs on 12" centers to provide semi-concealed through panel fastening

Each panel shall provide 36" of net coverage and shall be roll-formed utilizing material having a minimum tested yield strength of 50,000 psi.

4.3.3. Type "M" panel shall have 3/4" deep major ribs on 6" centers. Each panel shall provide 36" of net coverage and shall be roll-formed utilizing material having a minimum tested yield strength of 50,000 psi.

4.3.4. The "Ultra-Deck" standing seam panels shall be 3 inch tall snap-lock seamed. The flat width between major ribs shall be stiffened by two minor ribs. Each panel shall have 24" net coverage. Fasteners shall be concealed by use of clips and mounting plates.

### **4.4 Fasteners**

4.4.1. Sheet metal screws shall be No. 14 x 3/4" hex head, self-tapping with steel backed neoprene washers, or No. 12 x 1-1/4" self-drilling with steel backed neoprene washers. The type of fastener shall be as required by the builder.

4.4.2. Finishes

a. Standard buildings shall be furnished with cadmium plated screws.

b. When panels are color coated, all visible wall screws and metal washers shall be color coated to match.

### **4.5 Sealer**

Sealer for sidelaps, endlaps, and flashing shall be 1/2" wide by 3/32" thick, dark gray pressure sensitive tape. Service temperature range shall be from -60° F to +300° F.

### **4.6 Flashing, Closures, and Trim**

4.6.1. Flashing and/or trim shall be furnished at the rake, corners, and eaves, at framed openings, and wherever necessary to provide finished appearance.

4.6.2. A die-formed ridge cap shall be formed to match roof slope and shall be the same configuration as the roof panels.

4.6.3. Solid cell, preformed, rubber or neoprene closures matching the profile of the wall and roof panels shall be installed along the eave and/or rake where required.

### **4.7 Color Finish**

Color coated roof and wall panels, flashing and trims shall be available upon request and the color selections shall be made from the manufacturer's standard selection. Color coated panels shall be available with the supplier's or manufacturer's standard written guarantee covering chalking, fading, blistering, checking, and peeling. Color coating specifications shall be available upon request.

## **5. ACCESSORIES**

5.1 Hollow metal swing doors in all standard sizes shall be furnished with standard passage latches, lock sets and thresholds.

5.2 Aluminum horizontal and vertical hung windows shall be furnished in all standard sizes. All windows shall meet the requirements for "Quality Certified" Aluminum Manufacturers Association Master Specification DH-AI. All windows shall carry the Seal of Approval of the AAMA. Windows shall be factory glazed and have half screens.

5.3 Skylights shall be 8 ounce glass fiber reinforced polyester translucent panels formed to match roof panel configuration. These shall be available in white standard or U.L. fire rated only.

5.4 Round ventilators shall be furnished in 20" diameter with dampers. Monovents shall be in 10' sections with either 9" or 12" throat sizes with or without dampers. Bird screen shall be furnished on both round ventilators and monovents.

## **6. BUILDING ANCHORAGE AND FOUNDATIONS**

### **6.1 Anchorage**

The building anchor bolts and related anchorage shall be designed to resist the column reactions resulting from the design loads.

The diameter of the anchor bolts shall be as specified by the building manufacturer. The anchor bolts shall be furnished by the concrete contractor or owner.

### **6.2 Foundation**

The building foundation design shall not be the responsibility of the building manufacturer and must be done by a qualified engineer based on actual job site soil and related conditions.