

1 GENERAL

1.1 SCOPE

This specification concerns the manufacture of and the construction details for metal buildings designed and constructed to be weather tight and easily erected. Dean Steel Buildings, Inc., designs its buildings to and adheres to the policies of MBMA's "Low Rise Building Systems Manual". The building shall include the structural framing, roof and wall covering, trim and closures, and accessories herein described.

1.2 DESCRIPTION

- 1.2.1 SM - Straight Column Rigid Frame Buildings with a roof slope of 1:12.
- 1.2.2 SS - Single Slope Rigid Frame Buildings with a roof slope of 0.5:12.
- 1.2.3 LR - Tapered Column Rigid Frame Buildings with a roof slope of 1:12.
- 1.2.4 LM - Tapered Column Rigid Frame Buildings with interior columns and a roof slope of 1:12.
- 1.2.5 RF - Tapered Column Rigid Frame Buildings with a roof slope of 4:12.
- 1.2.6 WU - Simple Span Frame Extensions from any of the above buildings and a roof slope of 1:12.

1.3 BUILDING NOMENCLATURE

- 1.3.1 The building "Width and Length" shall be measured from inside 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 rigid frame columns to the intersection of lines representing the inside of the wall covering and the inside of the roof covering.
- 1.3.3 The "Roof Slope" shall be the angle that the roof surface makes with the horizontal, expressed in the units of vertical rise to 12 units of horizontal run.
- 1.3.4 The "Bay Spacing" between frame center lines shall be 20', 25', or 30'. End bays shall be 18'-11", 23'-11", or 28'-11".

1.4 DRAWINGS

The building manufacturer shall furnish complete construction details showing anchor bolt settings; sidewall, endwall, and roof framing; transverse cross-sections; covering and flashing details; and accessory installation details to clearly indicate the proper assembly of all building parts.

1.5 U.L. UPLIFT RATINGS

The building manufacturer shall furnish, when required, a roof deck system having the Underwriters Laboratories wind uplift rating. DSB's roof deck systems are shown in the U.L. publications "Building Materials Directory," and are listed as:

- 1.5.1 Rib 6: Construction No 12 & 39
- 1.5.2 Rib 12: Construction No 65
- 1.5.3 ProSeam: Construction No 205
- 1.5.4 ProLok: Construction No 552, 552A & 552B

2 DESIGN

2.1 GENERAL

All structural steel sections and welded plate members shall be designed in accordance with AISC Specification for Structural Steel Buildings ANSI/AISC 360-10.

All cold-formed structural members and exterior covering shall be designed in accordance with the latest edition of the AISI,

"Specifications for the Design of Cold-Formed Steel Structural Members."

2.2 DESIGN LOADS

- 2.2.1 The following criteria for live loads and wind loads shall be followed in the design of standard building components permitted under the Florida Building Code 2010 and International Building Code 2012.
 - 2.2.1.1 The roof live load shall be applied to the horizontal roof projection according to specification 1607.11.2 (FBC), 1607.12.2 (IBC) and 1616.1 (FBC-HV).
 - 2.2.1.2 Wind loads shall be assumed to act horizontally and shall be applied as pressure and suction in accordance with ASCE 7-10, sections 26 - 31 inclusive. Wind loads are given in terms of 3-second gust and range from 105 mph to 210 mph.
 - 2.2.1.3 Florida counties Broward and Miami-Dade are categorized as high velocity. Buildings designated at high velocity shall comply with the requirements of sections 1611-1626, inclusive in the Florida Building Code.
- 2.2.2 Buildings may be designed to other building codes such as required by local jurisdictions. Please call for availability of codes not listed.
- 2.2.3 The building shall be designed to the load combinations specified in the applicable building code or the MBMA "Low Rise Building Systems Manual", 1996 edition.
- 2.2.4 Designs shall include the building dead load, roof live load, wind, snow and seismic load in accordance with Dean's interpretation of the building code. Additional collateral and auxiliary loads shall be included when specified by the buyer.

3 STRUCTURAL FRAMING

3.1 GENERAL

- 3.1.1 All framing members shall be shop-fabricated for bolted field assembly.
- 3.1.2 Primary structural framing shall include the transverse rigid frame, wing unit rafter beams and columns, canopy beams, intermediate columns, bearing end frames, endwall columns, and wind bracing.
- 3.1.3 Secondary structural framing shall include the purlins, girts, eave struts, jambs, headers, flange bracing, sill support, clips, and other miscellaneous structural parts.
- 3.1.4 All hot rolled steel sheet, plate, and strip for built-up sections shall have a minimum yield point of 55,000 psi. Web sheet is purchased in accordance with ASTM A1011 Grade 55. Flange bar is purchased in accordance with A529 Grade 55.
- 3.1.5 Hot rolled structural sections shall conform to the requirements of ASTM Specification A36 yield 50, A572 G55 or ASTM A992 G55.
- 3.1.6 Twelve, fourteen, fifteen, and sixteen gauge cold formed sections shall have a minimum yield point of 55,000 psi in accordance with ASTM A1011 G55. Galvanized sheet and strip for structural framing members shall conform to ASTM Specifications A653, Grade 90.
- 3.1.7 Pipe for columns and other structural uses shall have 42,000 psi yield. Square tubes conform to ASTM A500 Grade B.
- 3.1.8 Galvalume and pre-painted hot roll coils conform to ASTM A792 AZ55 and may be either 50,000 psi or 80,000 psi yield. See Section 4.
- 3.1.9 Unless otherwise specified, the minimum thickness of framing members shall be as follows:

| | |
|---------------------------------------|----------|
| Cold formed primary framing members | 14 gauge |
| Cold formed secondary framing members | 16 gauge |
| Intermediate pipe columns | 3/16" |
| Webs of welded built-up members | 12 gauge |

| | |
|---|--------|
| Flanges of welded built-up members..... | 3/16" |
| Bracing (Cable standard)..... | 1/4" Ø |
| Bracing (Rod optional)..... | 1/2" Ø |

- 3.1.10 Cold-formed sections shall be manufactured by precision roll or brake forming. All dimensions shall be true.
- 3.1.11 All shop connections shall be by welding in accordance with the AWS "Structural Welding Code" latest edition. Welding shall be by submerged arc or gas shielded arc process.
- 3.1.12 All field connections shall be field bolted with ASTM Specification A-307 or A-325 bolts as shown on drawings. A-325 bolts shall be tightened by the turn of the nut method. Connections in secondary members shall be made with special 1/2" Truss Head Fin Neck bolts and hex nuts when required. ASTM A-325 bolts are designed in accordance with RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) 2009 edition.
- 3.1.13 All framing members shall carry an easily visible identifying mark.

3.2 RIGID FRAMES, WING UNIT FRAMES, AND CANOPY BEAMS

All members shall be welded, built-up, "I" shapes, either constant depth or tapered.

3.3 BEARING END FRAMES

Bearing end frames shall be hot rolled sections and consist of columns at the building corners and a continuous rafter beam supported by the endwall columns. An optional bearing frame system will consist of cold formed "C" sections and "Z" sections.

3.4 ENDWALL COLUMNS

- 3.4.1 Endwall columns shall be hot rolled sections or welded built-up "I" shapes. Optional endwall columns will consist of cold formed "C" sections.
- 3.4.2 Endwall assemblies shall consist of hot rolled columns and bypass girts. Optional hot rolled columns or cold formed columns with insert girts are available upon request.

3.5 PURLINS AND GIRTS

Purlins and girts shall be cold formed "Z" sections with stiffened flanges. They shall be simple or continuous span as required by design.

3.6 EAVE STRUTS

Eave struts shall be 8" deep cold formed sections sufficient to provide adequate backup for both roof and wall panels at the building eaves.

3.7 WIND BRACING

- 3.7.1 Wind bracing in the roof and/or sidewall is not required where the diaphragm strength of the roof and/or wall covering is adequate to resist the longitudinal wind forces. If required, wind bracing shall be provided by diagonal cables.
- 3.7.2 OPTIONAL BRACING shall consist of wind bents (portal frames), fixed base wind columns, diagonal rod bracing, or diagonal angle bracing.
- 3.7.3 Buildings over 200' wide may require cable bracing at interior column lines.

3.8 FLANGE BRACING

The inside flange of all rafters and columns shall be braced laterally by angles connected to the flange of the frame and to the web of the purlin or girt so that the allowable compressive stress is adequate for any combination of loading.

3.9 BASE SUPPORT

A continuous member shall be provided to which the base of the wall covering may be attached. This member shall be galvanized or pre-painted red angle used in conjunction with a 1-1/2" sheet ledge formed in the concrete or optional 18 gauge galvanized painted Bronze base trim secured to the concrete floor with power driven fasteners or equivalent anchors.

3.10 FRAMED OPENINGS

Structural framing members for all openings shall be cold formed "C" sections and adequate for the specified design wind loads. As roll-up overhead doors transfer a large torsion load to the jamb, structural tube sections may be used.

3.11 EXPANSION JOINTS

- 3.11.1 Longitudinal expansion joints may be required when the building length exceeds 500'. These joints shall allow adequate expansion and contraction of the longitudinal members and roof and wall panels.
- 3.11.2 Transverse expansion joints may be required when the building width (span) exceeds 200' on gabled buildings or 100' single slope (these dimensions can be doubled when using Pro Seam panels with floating clips). These joints shall allow adequate expansion and contraction of the roof panels and shall be flashed to ensure weather tightness.

3.12 PAINTING

All structural framing members which are not galvanized shall be cleaned to remove dirt, grease, oil, and loose mill scale, and given one shop coat of iron oxide primer formulated to meet or exceed the performance requirements of Federal Specifications TT-P-636 and TT-P-664. Primer is for protection of steel building during transit and is not intended as an exterior finish.

4 ROOF & WALLS

4.1 STANDARD PANEL PROFILES

- 4.1.1 Rib-12 (RT) - 1-1/4" deep ribs 12" on center with two 1/4" deep intermediate stiffeners; 36" net coverage.
- 4.1.2 Shadow Panel (SP) - 1-1/4" deep recesses 12" on center with intermediate accent lines; 36" net coverage wall panel.
- 4.1.3 Rib-6 (RS) 3/4" deep ribs 6" on center; 36" net coverage.

4.2 STANDARD PANEL PROPERTIES (36")

- 4.2.1 Standard roof, wall, liner, and partition panels shall be 26 gauge unpainted Aluminum Zinc Alloy-Coated or 26 gauge color coated cold formed panels.
- 4.2.2 Material for 26 gauge color coated panels shall be Aluminum Zinc Alloy-Coated steel conforming to ASTM Specification A-792, Grade E, 80,000 psi, or galvanized (G-90) steel conforming to ASTM Specification A-653, Grade E, 80,000 psi.
- 4.2.3 Material for optional 24 gauge panels shall be unpainted or color coated Aluminum Zinc Alloy-Coated conforming to ASTM A-792, Grade E, 80,000 psi, or 24 gauge color coated cold formed panels on galvanized steel conforming to ASTM A-653 in Grade E, 80,000 psi.

4.3 STANDING SEAM PANEL PROFILE

- 4.3.1 Pro Seam - 3" self-locking trapezoidal rib roof panel, concealed fixed or floating clips, 24" net coverage.
- 4.3.2 Pro-Lok - 3" seamed trapezoidal rib roof panel, concealed fixed or floating clips, 24" net coverage.

4.4 STANDING SEAM PANEL PROPERTIES

Pro Seam and Pro-Lok panels shall be 24 gauge Aluminum Zinc Alloy-Coated steel ASTM A-792, Grade D, 50,000 psi.

4.5 FASTENERS

4.5.1 All self-tapping fasteners shall conform to USASB 18.6.4 and shall have type A or type AB threads. All self-drilling fasteners shall conform to IF 1113. Where required for weather tightness, fasteners shall be assembled with neoprene sealing washers.

4.5.2 Plating

- 4.5.2.1 All fasteners shall be plated to minimum thickness of .0005".
- 4.5.2.2 Optional extended corrosion resistant fasteners shall be Zac® (zinc-aluminum cast head) with aluminum and neoprene sealing washers.

4.6 SEALER

Sealer for side laps, end laps, and flashing shall be a butyl based polymer sealant in extruded tape form. The sealer shall be non-shrinking, non-drying, and non-toxic and shall have superior adhesion to metals, plastics, and painted surfaces. Service temperatures range from -30° to + 300°F. The material shall not flow at 120°F, and shall meet or exceed the requirements of Gov. Spec. No. MIL-C 18969 Type II, Class B and TT-C-1796A.

4.7 INSTALLATION OF ROOF AND WALL PANELS

- 4.7.1 Roof panels shall be continuous from ridge to eave for buildings 60' wide or less. Where end laps are required they shall be a minimum of 6" long and shall occur at a roof purlin.
- 4.7.2 Sidewall and endwall panels shall be continuous from sill to roof line except where length becomes prohibitive for handling purposes. Endwall panels for buildings with 4:12 roof slope may have a splice at the eave line.
- 4.7.3 Endwall panels shall be square cut for buildings with a 1:12 roof slope and bevel cut for buildings with a $\geq 2:12$ roof slope when the panel is longer than 5'-0".
- 4.7.4 Before securing, all laps of roof panels shall be sealed with a continuous ribbon of tape sealer.
- 4.7.5 Standard Roof Panels

The information below is general; please refer to your construction drawings for specific screw spacing information.

- 4.7.5.1 Roof panels shall be secured to purlins with #14 sheet metal screws at a maximum spacing of 12".
- 4.7.5.2 At end laps of rib sheets the maximum spacing shall be on each side of the major rib for Rib-12 panels and 6" on center for Rib-6.
- 4.7.5.3 Side laps to roof panels shall be stitched through the high flat of the rib with #14 sheet metal screws at a maximum spacing of 20" or 12" on center for wind loads 120 mph (fastest mile) or greater and 140 mph (peak gust) or greater.
- 4.7.6 Standing Seam Roof Panels

The information below is general; please refer to the construction booklet provided.

- 4.7.6.1 Pro Seam and Pro-Lok panels shall be secured by a fixed or floating clip with a 1/4-14 x 1-1/4" self drilling fastener at 24" on center and fastened to each purlin. Peak and panel laps shall be secured with compression joints consisting of rigid metal plates on the top and bottom of the panels.
- 4.7.7 Standard Wall Panels

The information below is general; please refer to your construction drawings for specific screw spacing information.

- 4.7.7.1 Wall panels shall be secured to girts with #14 sheet metal screws at a maximum spacing of 12".
- 4.7.7.2 At the end laps of rib sheets the maximum spacing shall be on each side of the major rib for Rib-12 panels and 6" on center for Rib-6.

- 4.7.7.3 At the side laps of sheets, #10 sheet metal screws shall be placed a maximum of 30" or 12" on center for wind loads 120 mph (fastest mile) or greater and 140 mph (peak gust) or greater.

4.8 FLASHING, CLOSURES, AND TRIM

- 4.8.1 Flashing and/or trim shall be furnished at the rake, corners, eaves, framed openings, and wherever necessary to provide weather tightness and a finished appearance.
- 4.8.2 Sculptured rake trim shall be roll formed 26, or optional 24, gauge material 20' long to minimize joints. Other trim shall be 26 gauge.
- 4.8.3 Sculptured rake trim material shall be Aluminum Zinc Alloy-Coated steel (50,000 psi yield) or optional color coated galvanized steel conforming to ASTM Specification A-653 Grade D (50,000 psi yield).
- 4.8.4 A formed panel matching the slope and profile of adjoining panels shall be provided along the building ridge for Rib-12 panels. A preformed metal outside closure and ridge flashing shall be used with standing seam panels.
- 4.8.5 Closure strips matching the profile of the panel shall be installed along the rake and/or eave where required for weather tightness. Closure strips shall be closed cell, semi-rigid, crosslinked polyethylene foam laminated for strength and uniform compressibility. Metal inside closure strips shall be used at the eave for standing seam panels.

4.9 COLOR FINISH

See DSB color charts for latest color selections and availability of finishes.

- 4.9.1 Exterior steel surfaces shall be Aluminum Zinc Alloy-Coated or optional color coated Aluminum Zinc Alloy-Coated or galvanized (G90) steel.
- 4.9.1.1 Color of roof panels, wall panels, and corner trim shall be selected from Dean's standard colors.
- 4.9.1.2 The roof ventilators shall be Aluminum Zinc Alloy-Coated or Oyster white.
- 4.9.1.3 Gutter, rake trim, downspouts, eave trim, and door flashing shall be Aluminum Zinc Alloy-Coated or prepainted galvanized in 26 ga. in standard colors shown on Dean's color card. Optional 24 ga. available in Aluminum Zinc coated or prepainted galvanized White or Bronze.
- 4.9.2 The color surface shall be a silicon-polyester co-polymer resin type to give superior adhesion and durability. The coating shall be a D.F.T. of 1.0 mil thick (+ .1 mil). The reverse or backer coat shall be a straight polyester with a D.F.T. of 0.5 mil thickness.
- 4.9.3 The Dean color coated panels are available with optional 5-, 10-, and 20-year written limited guarantees. For additional information on the primer, finish coat, or guarantee please contact your Dean representative.

5 ACCESSORIES

5.1 HOLLOW METAL SWING DOORS

- 5.1.1 3070 door leafs shall be 1-3/4" thick, full flush, 20 gauge hot dipped galvanized (G60). The leafs shall have an expanded polystyrene core, a closed cell, rigid thermoplastic material used for insulation against heat or cold. "U" factor of .16 and "R" factor of 6.5, sound transmission of .32. Meets or exceeds Federal Specification HH-1-524-C Types I, II, III.
- 5.1.2 Door frames shall be non-handed universal type frame, 16 gauge galvanized steel with reinforced recessed hinge plates.
- 5.1.3 Doors shall be furnished with a satin stainless steel lockset, 2-3/4" backset, and A.S.A. strike plate.
- 5.1.4 Optional panic hardware shall be a horizontal push bar of wrought steel channels and available either exit only or entrance/exit. Slight pressure on the push bar shall release

the door latch for immediate exit. A removable mullion shall be required for double door openings.

- 5.1.5 Each door leaf shall swing from (3) 4-1/4" x 4-1/2" steel full mortise, plain bearing hinges.
- 5.1.6 Door leafs and frames are manufactured with one coat of tinted white primer (Ceco).
- 5.1.7 The threshold shall be an extruded aluminum shape to provide positive weather seal.
- 5.1.8 Optional 3070 Glasslite doors shall have 6" x 30" factory pre-glazed tempered glass panel. Glasslite doors are not adequate for buildings permitted by the FBC and are not impact resistant.
- 5.1.9 4070 and 6070 door packages are available upon request; specifications and supplier may vary from above.

5.2 SLIDING DOORS

- 5.2.1 Sliding door leafs shall be constructed of bolted steel framing covered with matching wall panels.
- 5.2.2 The leafs shall be suspended from a galvanized steel track by dual-wheeled, galvanized steel, permanently lubricated trolley hangers. The track brackets and trolleys shall be protected by a counter-flashed hood.
- 5.2.3 Sliding door jambs and headers (when required) shall be cold formed channel sections having one standard shop coat of primer.

5.3 SKYLIGHTS

- 5.3.1 Skylight panels shall be general purpose glassfiber reinforced polyester structural plastic panels.
- 5.3.2 Skylights shall be white smooth surface finished, in a profile matching the roof panels and shall weigh 8 ounces per square foot. Skylights conform to PS 53-72, Type I (burn rate of not less than 2.0 inches per minute). Note: Voluntary Product Standard PS 53-72, issued by the U.S. Department of Commerce January 1, 1972, has been replaced as the Standard Specification by ASTM D 3841-81.
- 5.3.3 Additional fall protection must be provided in accordance with OSHA regulations.

5.4 EAVE GUTTERS AND DOWNSPOUTS

- 5.4.1 Sculptured eave gutter 4-1/2" x 5" shall be roll formed 26 gauge, or optional 24 gauge, 20' long for ease of erection. Gutter shall be fastened with gutter brackets at 3' spacing after roof and wall sheets are in place. Contour of the gutter shall match the rake flashing and allow for easy field miter of the corner without an auxiliary corner box.
- 5.4.2 Downspouts shall be 26 gauge steel, 4" x 5". Downspouts shall have a 45° elbow at the bottom and shall be supported by attachment to the wall covering at 6' maximum spacing.

5.5 WINDOWS

- 5.5.1 Horizontal slide aluminum windows shall be self-flashing, furnished with a sash lock, weather-stripping, and a half screen. The exposed surfaces shall be finished in Bronze enamel paint. The windows shall be factory glazed with double strength (DSB) glass.
- 5.5.2 Accent windows shall be self-flashing fixed glass. The exposed surfaces shall be finished in Bronze enamel paint. The windows shall be factory glazed with tinted tempered glass.
- 5.5.3 Windows supplied by DSB may not be adequate for all wind loads and are not impact resistant.

5.6 VENTILATORS

Ridge ventilators shall be gravity type, fabricated from Aluminum Zinc Alloy-Coated steel or galvanized steel painted Oyster White.

- 5.6.1 Monovents shall have a 9" or 12" throat and are furnished in 10' lengths. Splice plates and end caps, where required, shall be provided to make up the specified length. All monovents shall be furnished with bird screen. Optional damper shall provide an adjustable opening at the throat and shall be of the manually-operated pull chain type.
- 5.6.2 Lo-profile vents are designed for ProSeam, Pro-Lok and Rib-12 roof systems and offer pleasing, efficient ventilation. Vents come in 10' lengths, single or continuous, 6-1/2" throat @ 1:12 pitch, 450 CFM Base Rating.

5.7 LOUVERS

Louvers shall be fabricated from 26 gauge galvanized steel and shall have overlapping blades for maximum weather tightness. Blade shall be fixed with integral bird screen. Color shall be oyster white unless otherwise specified.

6 BUILDING ANCHORAGE AND FOUNDATION

6.1 ANCHOR BOLTS

Anchor bolts shall resist 100% of the critical column reactions (shear and/or tension) determined from the load combinations. The manufacturer is responsible for design of anchor bolt diameter and projection above the concrete foundation, but is not responsible for the transfer of anchor bolt forces to the concrete nor the adequacy of the anchor bolts in relation to the concrete; this is the responsibility of the buyer. Anchor bolts supplied by DSB (optional) will be 36 KSI yield.

6.2 FOUNDATION

The building foundation shall be designed by a qualified engineer to support the building reactions in addition to other loads imposed by the building use or occupancy. The design shall be based on actual jobsite conditions. Foundation design shall include provisions for bolt embedment, length, hook, bearing angles, kickout bars, tie rods, and any other associated items embedded in the concrete. Dean Steel Buildings, Inc., does not design nor assume responsibility for the design, materials, or workmanship of the foundation.

Specifications cover buildings manufactured by Dean Steel Buildings, Inc. In keeping with Dean Steel Buildings, Inc., policy of continuous product improvement, specifications are subject to change without notice.

DEAN STEEL BUILDINGS, INC.

General Offices & Mfg. Plant
2929 Industrial Avenue
Fort Myers, Florida 33901
(239) 334-1051 • FAX: (239) 334-0932



Mfg. Plant
500 Tenth Street
Cedartown, Georgia 30125
(770) 748-7900 • FAX: (770) 749-5300

IAS AC-472
Accredited

www.deansteelbuildings.com

Mfg. Plant
71 Airport Road
Thomasville, Georgia 31757
(229) 225-1112 • FAX: (229) 225-1175

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