

V. GUIDE SPECIFICATIONS

Use of this Specification is totally voluntary. Each building designer retains the prerogative to choose their own design and commercial practices and the responsibility to design and specify building systems to comply with applicable state and local codes, specifications and safety considerations.

Although every effort has been made to present accurate and sound information, MBMA assumes no responsibility whatsoever for the application of this information to the design, specification or construction of any specific building. *MBMA expressly disclaims all liability for damages of any sort whether direct, indirect or consequential, arising out of the use, reference to or reliance on this Specification or any of its contents.*

**PRODUCER ENGINEERED STEEL BUILDING SYSTEMS
(PRE-ENGINEERED METAL BUILDINGS)**

Note: Notes shown in bold italics are for the guidance of the user and are not to be included as part of the specification.

This specification includes metal building systems designed by the manufacturer and supplied by a single source. The system includes building frames, steel wall and roof systems. Cladding may be other producer supplied under other sections of the specification. Specifications for doors, windows and other fenestrations are included. This specification does not include foundations, floor slab, plumbing, electrical, HVAC, or interior finishing.

This Section includes performance and prescriptive type specifications. Edit to avoid conflicting requirements.

This specification covers the design, material, fabrication, shipment and erection of metal building systems. For the material, erection and other field work included and excluded in the metal building system refer to MBMA Common Industry Practices.

If bar joists are used for purlins, strike purlins from 1.01A and include paragraph 1.02F.

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural steel main building frames and secondary framing including purlins and girts, engineered and fabricated by the building systems supplier.
- B. [Insulated] steel wall and roof system including [soffits], [gutters and downspouts], [and][.] [_____].
- C. [Exterior doors], [windows], [translucent panels], [overhead doors], [louvers], [and][.] [_____].

NOTE: *List Sections which specify installation of products specified in this Section and indicate specific items.*

1.02 RELATED SECTIONS

- A. Section [_____ - _____]: Placement of [anchor bolts.] [leveling lates.] [_____].
- B. Section [_____ - _____]: Drainage piping from downspouts to [municipal sewers.] [_____].
- C. Section [_____ - _____]: Concrete [footings] [grade beams] [and][.] [floor slab.]
- D. Section [_____ - _____]: [Overhead] [_____] doors.

- E. Section - Painting: Finish painting [of primed steel surfaces] [and][_____.] [.]
- F. Section [_____-_____]; [Steel bar joist].

1.03 REFERENCES

NOTE: *List reference standards that are included within the text of this Specification. Edit the following as required for project conditions.*

- A. AISI - Specification for the Design of Cold-Formed Steel Structural Members - 1986 Edition with 1989 Addendum.
- B. AISC - Specification for Structural Steel Buildings - 1989.
- C. AISC - Steel Design Guide Series 3 - Serviceability Design Considerations for Low-Rise Buildings - 1990.
- D. ASTM A36-92 - Specification for Structural Steel.
- E. ASTM A153-82(1987) - Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
- F. ASTM A307-92A - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
- G. ASTM A325-92A - Specification for High Strength Bolts for Structural Steel Joints.
- H. ASTM A123-89A - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- I. ASTM A446-91 - Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical Quality).
- J. ASTM A463-88 - Specification for Steel Sheet Cold Rolled Aluminum Coated Type 1 and Type 2.
- K. ASTM A490-92A - Specification for Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.
- L. ASTM A500-92 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- M. ASTM A501-92 - Hot Formed Welded and Seamless Carbon Steel Structural Tubing.

- N. ASTM A525-91B - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements.
- O. ASTM A529-92A - Structural Steel with 50,000 psi Minimum Yield Point.
- P. ASTM A570-92 - Specification for Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.
- Q. ASTM A572-92B - Specification for High Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
- R. ASTM A792-89 - Specification for Steel Sheet Aluminum Zinc Alloy Coated by the Hot Dip Process, General Requirements.
- S. ASTM C665-91 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- T. ASTM D1494-92 - Test Method for Diffused Light Transmission Factor of Reinforced Plastic Panels.
- U. ASTM E1514-93 - Specification for Structural Standing Seam Steel Roof Panel Systems.
- V. AWS A2.4-93 - Standard Welding Symbols.
- W. AWS D1.1-94 - Structural Welding Code - Steel.
- X. AWS D1.3-89 - Structural Welding Code - Sheet Steel.
- Y. MBMA Low Rise Building Systems Manual - 1996 Edition.
- Z. NAIMA 202-92 - Standard for Flexible Fiberglass Insulation Systems in Metal Buildings.
- AA. SJI (Steel Joist Institute) - Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders - 1992.
- BB. SSPC (Steel Structures Painting Council) - SP-2-89 - Specification for Hand Tool Cleaning.

1.04 SYSTEM DESCRIPTION

NOTE: *Use this Article carefully; restrict statements to describe components used to assemble the system. Do not repeat statements made in Article 1.01 - SECTION INCLUDES.*

- A. [Clear span rigid frame.] [Modular rigid frame supported with intermediate columns.] [Truss systems.] [_____].
- B. [____ minimum clearance at knee].
[____ minimum clearance haunch to haunch].
[____ inch depth straight exterior columns].
[____ critical dimension at ____].
- C. Bay spacing of [____] ft. ([____] m) [as shown on drawings].
- D. Primary Framing: Rigid frame of rafter beams and columns, [intermediate columns] [braced end frames] [end wall columns] [_____], and wind bracing.
- E. Secondary Framing: [Purlins], [girts], [eave struts], [flange bracing], [canopy beams], [_____], and other items detailed.
- F. Lateral Bracing: Horizontal loads not resisted by main frame action shall be resisted by [cable] [rod] and/or [diaphragm] [portal frames] [fixed base columns] [_____] in the sidewall. [Diaphragm] and/or [cable] [rod] [portal frame] [fixed base columns] [_____] in the endwall. [Cable] [rod] and/or [diaphragm] [_____] in the roof.
- G. Wall and Roof System: Preformed steel panels [insulation], [liner sheets], and accessory components.
- H. Roof Slope: [1/4] [1/2] [1] [2] [4] [____] in 12 ([1.5°] [3°] [5°] [10°] [20°] [____°]).

1.05 DESIGN REQUIREMENTS

NOTE: *Use this Article carefully; restrict statements to identify system design requirements only. Refer to Section 2.01B and 2.02C for specification of insulation thickness.*

- A. Members to withstand building system dead loads, ground snow load of _____ psf, [__ snow exposure], live load of _____ psf [with] [without] tributary area load reduction, [collateral load of _____ psf,] wind load of _____ mph [__ exposure], seismic acceleration of _____ A_v and _____ A_a [seismic zone __], building use (occupancy) category _____. All loads shall be proportioned and applied in

1.06 SUBMITTALS

- A. Submit anchor bolt placement plan, column reactions [,_____].

NOTE: *Do not request additional submittals if Contract Documents sufficiently describe the products of this Section. Require only submittal of material which must be verified by the specifier.*

- B. Product Data: Provide data on [profiles], [component dimensions], [fasteners,] [and] [_____] [.]

NOTE: *When manufacturer's instructions for specific installation requirements are referenced in PART 3 EXECUTION, include the following request for submittal of those instructions. Edit the PART 3 statements to avoid conflict with manufacturer's instructions.*

- C. Manufacturer's Installation Instructions: Indicate preparation requirements, assembly sequence, [and] [_____].

1.07 QUALITY ASSURANCE

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

1.08 QUALIFICATIONS

- A. Manufacturer: The company manufacturing the products specified in this Section [shall have a minimum of [___] year[s] experience in the manufacture of steel building systems.] [The manufacturing company shall be certified under the American Institute of Steel Construction's MB Certification Program.]
- B. Structural framing and covering shall be the design of a licensed Professional Engineer experienced in design of this work.

NOTE: *Include the following section for projects involving additions to or adjacent to existing structures.*

1.09 FIELD MEASUREMENTS

- A. Metal building contractor [_____] shall verify that field measurements are as [indicated [on contract] [on erection drawings].] [instructed by the manufacturer.]

1.10 WARRANTY

NOTE: *Panel warranties generally are available to include coverage against perforations. Paint warranties generally include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Roof warranties may be available through the metal building contractor to include coverage for weather tightness of building enclosure elements after installation.*

A. Building manufacturer shall provide manufacturer's standard material warranty.

- OR -

A. Building manufacturer shall provide a material warranty of _____ year[s].

B. Metal building contractor shall provide a workmanship warranty of _____ year[s].

1.11 ADMINISTRATION

A. All nomenclature shall conform to the MBMA Low Rise Building Systems Manual.

B. Coordination and administration of the work shall be in accordance with the MBMA Low Rise Building Systems Manual - Common Industry Practices.

PART 2 PRODUCTS

NOTE: *Edit the following descriptive specifications to identify project requirements.*

2.01 MATERIALS - ROOF SYSTEM

NOTE: *The following materials listing is oriented to site assembled roof component assemblies. Manufacturer's standard fasteners must be commensurate with panel material and performance level specified.*

- A. Sheet Steel Stock: [Galvanized to [G90] [_____] designation] [zinc-aluminum coated to [AZ55][_____] designation] [aluminized] as required by manufacturer's design.
- B. Roof Insulation: [ASTM C665], [semi-rigid] [batt] [roll] glass fiber type, [unfaced] [faced with reinforced [foil] [white vinyl]] [UL flame spread classification of 25 or less where exposed], [friction fit], [_____] inches ([_____] mm) thick.

- OR -
- B. Roof Insulation: Rigid board type as manufactured by _____ [R____] [_____] inches ([_____]) ([_____]mm) thick.
- C. Through Fastened Roofing: Minimum ____ gauge [_____] inch ([_____] mm) metal thickness, [_____] profile, [UL 90 rated] [[lapped] [male/female] edges][.] [with continuous sealant.]

- OR -
- C. Standing Seam Roofing: Minimum ____ gauge [_____] inch ([_____] mm) metal thickness, [_____] profile, [UL 90 rated] [snap] [mechanical seam] edges.
- D. Soffit Panels: Minimum ____ gauge [_____] inch ([_____] mm) metal thickness, [flat] [_____] profile [indicated], [perforated for ventilation.] [unperforated.]
- E. Closures: Manufacturer's standard type.
- F. Fasteners: Manufacturer's standard type, [_____] [stainless steel/stainless steel cap] finish to match adjacent surfaces when exterior exposed. Size to maintain load and weather tightness requirements.
- G. Sealant: Manufacturer's standard type.

NOTE: *Include H & I if panel is to have a color finish.
PVDF is a premium finish and is normally furnished at an increased cost and delivery time.*

- H. Exterior Surfaces of Roof Panels: Precoated steel of [polyester] [silicone polyester] [polyvinylidene fluoride (PVDF)] [_____] finish, [_____] color[.] [as selected from manufacturer's standard range.]
- I. Interior Surfaces of Roof Panels: Precoated steel of [(polyester) (acrylic)] [silicone polyester] [_____] finish, [_____] color [.] [as selected from manufacturer's standard range.]

2.02 MATERIALS - WALL SYSTEMS

- A. Sheet Steel Stock: [Galvanized to [G90] [____] designation] [zinc-aluminum coated to [AZ55][____] designation] [aluminized] as required by manufacturer's design.
- B. Siding: Minimum [____] gauge [[____] inch] ([_] mm) metal thickness, [____] profile [indicated], [_] inch ([_] mm) deep, [[lapped] [male/female] edges].
- C. Wall Insulation: [ASTM C665], [batt] [roll] glass fiber type, [unfaced] [faced with reinforced [foil] [white vinyl] [UL flamespread classification of 25 or less where exposed], [____] inches ([____] mm) thick.
- D. Liner: Minimum _____ gauge [____] inch ([_] mm) metal thickness, [flat] [perforated] profile [indicated], [[lapped][male/female] edges.]
- E. Closures: Manufacturer's standard type.
- F. Fasteners: Manufacturer's standard type, [_____] [stainless steel/stainless steel cap] finish to match adjacent surfaces when exterior exposed. Size to maintain load and weather tightness requirements.

NOTE: *Include G & H if panel is to have a color finish.
PVDF is a premium finish and is normally furnished at an increased cost and delivery time.*

- G. Exterior Surfaces of Wall Panels: Precoated steel of [[polyester] [acrylic]] [silicone polyester] [polyvinylidene fluoride (PVDF)][_____] finish, [_____] color[.] [as selected from manufacturer's standard range.]
- H. Interior Surfaces of Wall Panels: Precoated steel of [polyester] [_____] finish, [_____] color[.] [as selected from manufacturer's standard range.]

2.03 MATERIALS - TRIM

- A. Flashings, Internal and External Corners, Closure Pieces, [Fascia], [Infills], [Caps], and [_____]: Same material and finish as adjacent material, profile [to suit system.] [formed as detailed.] [_____] color as selected from manufacturer's standard range.

2.04 METAL PERSONNEL DOORS AND FRAMES

NOTE: *Select one of the specifying methods indicated below. If the first method is used, ensure manufacturers' product criteria is accurately described.*

Door and frame shall be designed by the manufacturer to meet the wind load provisions as specified in Section 1.05A. Door shall be designed using beam action to transfer loads from jamb to jamb.

- A. Building system manufacturer's standard door and frame type as shown on [plan],[schedules].

- OR -

- A. Building system manufacturer's:

	Type	Size	Model No.
1.	[_____]	[_____]	Model [_____].
2.	[_____]	[_____]	Model [_____].
3.	[_____]	[_____]	Model [_____].

2.05 DOORS AND FRAMES OTHER THAN PERSONNEL

Door and frame shall be designed by the manufacturer to meet the wind load provisions as specified in Section 1.05A. Door shall be designed using beam action to transfer loads from jamb to jamb.

- A. Door:

	Type	Manufacturer	Size	Model No.
1.	[_____]	[_____]	[_____]	Model [_____].
2.	[_____]	[_____]	[_____]	Model [_____].
3.	[_____]	[_____]	[_____]	Model [_____].

- B. Door Frame: Building system manufacturer's standard [_____].

2.06 WINDOWS

NOTE: *Select one of the specifying methods indicated below. If the first method is used, ensure manufacturers' product criteria is accurately described.*

Windows shall be designed by the manufacturer to meet the wind load provisions as specified in Section 1.05A.

- A. Building systems manufacturer's standard window and frame type as shown on [plans], [schedules].

- OR -

- A. Building system manufacturer's:

Type	Size	Model No.
1. [_____]	[_____]	Model [_____].
2. [_____]	[_____]	Model [_____].
3. [_____]	[_____]	Model [_____].

2.07 TRANSLUCENT PANELS

- A. Translucent roof panels shall be [_____] [clear] [white] translucent [insulated] [UL 90 rated] panels capable of sustaining a 200 pound concentrated load on a one foot square located anywhere on the panel without rupture. Translucent panels shall be compatible with the steel roof panels. Panel shall be 8 [___] oz. per square foot and shall have a fire retardant rating of _____. The minimum variable light transmission shall be [60%] [_____] when measured in accordance with ASTM D1494.
- B. Translucent wall panels shall be [_____] [clear] [white] translucent [insulated] panels and be compatible with the steel wall panels. Panel shall be 8 [___] oz. per square foot and shall have a fire retardant rating of _____. The minimum variable light transmission shall be [60%] [_____] when measured in accordance with ASTM D1494.

2.08 FABRICATION - PRIMARY FRAMING

- A. Framing Members: Clean in accordance with SSPC-SP2, prepare, and [coat with building manufacturer's standard primer.] [galvanize to ASTM A123, Class B.] [supply black (unpainted).]
- B. Hot rolled members shall be fabricated in accordance with AISC Specification for pipe, tube, and rolled structural shapes.
- C. Fabricate built-up members in accordance with MBMA Low Rise Building Systems Manual, Common Industry Practices.

2.09 FABRICATION - WALL AND ROOF FRAMING

- A. Framing Members: Clean in accordance with SSPC-SP2, prepare, and [coat with building manufacturer's standard primer.] [galvanize to ASTM A123, Class B.] [supply black (unpainted).]
- B. Cold Formed Members: Cold formed structural shapes shall be fabricated in accordance with MBMA Low Rise Building Systems Manual, Common Industry Practices.

2.10 ACCESSORIES

NOTE: *Describe ventilator type to be used: continuous ridge type, intermittent ridge type, end wall type, dampered, exhaust grilles, gravity vent, screens, operators.*

- A. Ventilator: [_____].
- B. Wall Louvers: [_____] type ['Z'] ['Y'] [] blade design, [same finish as adjacent material] [_____], [with steel mesh [bird] [insect] screen and frame], [blank sheet metal] [_____] at unused portions. Louvers shall be designed by the manufacturer to meet the wind load provisions as specified in Section 1.05A.
- C. Provide framing for [_____] openings.
- D. Curbs for HVAC, skylights, hatches, etc. shall be compatible with steel roof panel and sealed against water penetration in accordance with building manufacturer's instructions.

2.11 FABRICATION - GUTTERS AND DOWNSPOUTS

- A. Fabricate gutters from manufacturer's standard [_____]. Color as selected from manufacturer's standard offering.
- B. Fabricate downspouts from manufacturer's standard [_____]. Color as selected from manufacturer's standard offering.
- C. Form gutters and downspouts (and scuppers) of [_____] profile and size [indicated] to collect and remove water. Fabricate with connection pieces.
- D. Form sections in maximum possible lengths. Hem exposed edges. [Allow for expansion at joints.]

- E. Fabricate gutter support straps of manufacturer's standard material and finish.
- F. Fabricate downspout support straps of manufacturer's standard material. Finish color as selected.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify site conditions under provisions of Section [_____].
- B. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.
- 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.

3.02 ERECTION - FRAMING

- A. Erect framing in accordance with MBMA Low Rise Building Systems Manual, Common Industry Practices.
- B. 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 equipment 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. The temporary guys, braces, falseworks and cribbing are the property of the erector, and the erector shall remove them immediately upon completion of erection.
- C. Do not field cut or alter structural members without approval of the metal building manufacturer.
- D. After erection, prime welds, abrasions, and surfaces not [shop primed.] [galvanized.]

3.03 ERECTION - WALL AND ROOFING SYSTEMS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.

3.04 ERECTION - GUTTER AND DOWNSPOUT

- A. Install gutters and downspouts in strict accordance with manufacturer's instructions.
- B. Connect downspouts to [storm sewer system.] [_____].
- OR -
- B. Install splash [pans.] [pads.] [_____].

3.05 ERECTION - TRANSLUCENT PANELS

- A. Install in accordance with manufacturer's instructions.
- B. Coordinate with installation of roofing system and related flashings.
- C. Provide weathertight installation.

3.06 INSTALLATION - ACCESSORIES

NOTE: *If accessories are referenced to another Section, they must be edited in that Section; delete the applicable statements below.*

- A. Install [door frame], [door], [overhead door], [window and glass], [and] [_____] in accordance with manufacturer's instructions .
- B. Seal wall and roof accessories weathertight.

3.07 TOLERANCES

- A. All work shall be performed in a workmanlike manner.
- B. Install Framing in accordance with MBMA Low Rise Building Systems Manual, Common Industry Practices.