METAL BUILDING SYSTEM SPECIFICATIONS

1. GENERAL

1.1. SCOPE

1.1.1. The attached specifications cover the standard materials and components used in the design and fabrication of Miller Building Systems, Inc's ("Miller") metal building systems.

1.1.2. These specifications describe Miller's "standard" metal building system. In the absence of contract requirements or restrictions to the contrary, these specifications accurately describe the product provided by Miller. However, these specifications are in no way intended to limit the available options associated with Miller's metal building system.

1.1.3. These specifications are an outline of performance to insure that the architect, engineer, builder and/or owner understand the basis for design, manufacture and application of all Miller metal building systems.

1.1.4. Due to a continuing program of research and development, specifications in this manual are subject to change without notice.

1.2. BUILDING DESCRIPTION

1.2.1. Gable (SYM, UNSYM) is a continuous frame building. The primary frames have tapered columns and rafters with continuous sidewall girts bypassing the column or uniform depth columns and tapered rafters with Simple span sidewall girts inset into the column line. Also it may have one or more interior columns.

1.2.2. Single Slope (SS) is a continuous frame building. The primary frames have tapered columns and rafters with continuous sidewall girts bypassing the column or uniform depth columns and uniform depth or tapered rafters with Simple span sidewall girts inset into the column line. Also it may have one or more interior columns.

1.2.3. Lean-To (LT) is a single slope extension to a primary structure which provides structural support. These units usually have the same standard roof slope and girt design as the building to which they are attached.

1.3. BUILDING NOMENCLATURE

1.3.1. Standard Roof Slope

1.3.1.1 1/2" of rise for each 12" of horizontal run (Gable, Single Slope, Lean-To).

1.3.1.2 1" of rise for each 12" of horizontal run (Gable, Single Slope, Lean-To).

1.3.1.3 4" of rise for each 12" of horizontal run (Gable, Single Slope, Lean-To).

1.3.2. Building "Width" is measured from outside to outside of sidewall steel line.

1.3.2.1 For sheeted sidewall, steel line is outside of sidewall girt.

1.3.2.2 For open sidewall, steel line is back of eave strut.

1.3.3. Building "Eave Height" is measured from the bottom of the top of finished floor to the intersection of the roof and sidewall sheets(top of eave strut in most cases).

1.3.4. Building "Length" is measured from outside to outside of endwall steel line.

1.3.4.1 For sheeted endwall, steel line is outside of endwall girt.

1.3.4.2 For open endwall, steel line is outside of sheeting angle @ rake.

1.3.5. Standard "Bay Spacing" @ sidewall shall be 20', 25' or 30', unless otherwise specified.

1.3.5.1 End bay space is measured from steel line to center line of frame.

1.3.5.2 Interior bay spaces are measured from center line to center line of frames.

1.3.6. Standard “Bay Spacing” @ endwall shall be 15’, or 20’, unless otherwise specified.

1.3.6.1 End bay space is measured from steel line to center line of endwall column.

1.3.6.2 Interior bay spaces are measured from center line to center line of endwall columns.

1.4. DRAWINGS & CERTIFICATION

1.4.1. Drawings: Miller shall furnish the following drawings with all metal building systems for the proper identification and assembly of building components.

1.4.2. Anchor Bolt Plan: Shows the diameter, location and projection of all anchor bolts for the components of the metal building system. Column/bracing reactions and base plate size will also be shown.

1.4.3. Erection Drawings: Complete erection (framing) drawings for the proper identification & assembly of all building components. These drawings will show main frame cross sections, sidewall, endwall and roof framing plans, sheeting/trim & insulation layouts.

1.1.1. Certifications: Standard drawings shall bear the seal of a registered professional engineer upon request.

2. STRUCTURAL STEEL DESIGN

2.1. GENERAL

2.1.1. Miller shall use standards, specifications, recommendations, findings and/or interpretations of professionally recognized groups such as American Institute of Steel Construction (AISC), American Iron and Steel Institute (AISI), American Welding Society (AWS), ASTM International (formerly the American Society for Testing and Materials, ASTM), Metal Building Manufacturer’s Association (MBMA), and the Society for Protective Coatings (SSPC) as the basis for establishing engineering, design, fabrication, and quality criteria, practices, and tolerances. For convenience, one or more sources may be referenced in a particular portion of these specifications. In all instances, however, Miller’s engineering, design, fabrication and quality criteria, practices, and tolerances shall govern, unless specifically stated otherwise in the contract documents.

2.1.2. Structural mill, or welded up plate components shall be designed in accordance with AISC’s “Specification for Structural Steel for Buildings,” Allowable Stress Design and Plastic Design, June 1, 1989.

2.1.3. Cold-formed steel structural members will be designed in accordance with AISI’s “Specification for the Design of Cold-formed Steel Structural Members,” latest edition.

2.2. DESIGN LOADS

2.2.1. The design loads for the building shall be, in addition to their own dead load, the live, wind, snow and seismic loads required of the following as specified.

2.2.1.1 International Building Code, by the International Code Council.

2.2.1.2 Standard Building Code, by the Southern Building Code Congress International, Inc.

2.2.1.3 Uniform Building Code, by the International Conference of Building Officials.

2.2.1.4 National Building Code of Canada, by the National Research Council of Canada.

2.2.1.5 Metal Building Systems Manual, by the Metal Building Manufacturers Association.

2.2.2. The building components shall be designed to meet the most severe conditions of load combinations set by the specified building code, but in no case be less than that produced by the following load combinations:

2.2.2.1 Building dead load plus roof live load (or snow)

2.2.2.2 Building dead load plus wind load

2.2.3. Roof live and snow loads shall be applied on the horizontal roof projection. Wind loads shall be assumed to act horizontally and shall be applied as pressure and suction perpendicular to the building surfaces.

2.3. DESIGN POLICY

2.3.1. Miller's standard design practices incorporate Serviceability Limits from the International Building Code, indicated in the "Metal Roof & Walls Panels" table below. Owner requirements that exceed Miller's standards must be included in the building order documents. The applicable building code may also provide deflection limitations. "Flexible Ceiling" schedule will be used for buildings that have suspended or sheet rock ceilings. "Flexible Wall" schedule will be used for buildings that have sheet rock interior walls, or some type of flexible exterior wall material (e.g., wood). "Brittle Ceiling" schedule will be used for buildings that have plaster ceilings. "Brittle Wall" schedule will be used for buildings that have masonry, glass, stucco, EIFS, etc. walls.

Metal Roof & Wall Panels	
Endwall Column	L/120
Endwall Rafter (live)	L/180
Endwall Rafter (wind)	L/180
Wall Girt	L/90
Roof Purlin(live)	L/150
Roof Purlin(wind)	L/150
Wall Panel	L/60
Roof Panel (live)	L/60
Roof Panel (wind)	L/60
Rigid Frame (horizontal)	H/60
Rigid Frame (seismic)	H/50
Rigid Frame (vertical)	L/180
Wind Framing	H/60
Wind Framing (seismic)	H/60

Fexible Ceiling .	
Endwall Column	L/120
Endwall Rafter (live)	L/240
Endwall Rafter (wind)	L/240
Wall Girt	L/90
Roof Purlin(live)	L/240
Roof Purlin(wind)	L/240
Wall Panel	L/60
Roof Panel (live)	L/60
Roof Panel (wind)	L/60
Rigid Frame (horizontal)	H/60
Rigid Frame (seismic)	H/50
Rigid Frame (vertical)	L/240
Wind Framing	H/60
Wind Framing (seismic)	H/60

Flexible Wall .	
Endwall Column	L/120
Endwall Rafter (live)	L/180
Endwall Rafter (wind)	L/180
Wall Girt	L/90
Roof Purlin(live)	L/150
Roof Purlin(wind)	L/150
Wall Panel	L/60
Roof Panel (live)	L/60
Roof Panel (wind)	L/60
Rigid Frame (horizontal)	H/60
Rigid Frame (seismic)	H/50
Rigid Frame (vertical)	L/180
Wind Framing	H/90
Wind Framing (seismic)	H/60

Brittle Ceiling .	
Endwall Column	L/120
Endwall Rafter (live)	L/360
Endwall Rafter (wind)	L/360
Wall Girt	L/90
Roof Purlin(live)	L/360
Roof Purlin(wind)	L/360
Wall Panel	L/60
Roof Panel (live)	L/60
Roof Panel (wind)	L/60
Rigid Frame (horizontal)	H/60
Rigid Frame (seismic)	H/50
Rigid Frame (vertical)	L/360
Wind Framing	H/60
Wind Framing (seismic)	H/60

Brittle Wall	**.**
Endwall Column	L/240
Endwall Rafter (live)	L/180
Endwall Rafter (wind)	L/180
Wall Girt	L/240
Roof Purlin(live)	L/150
Roof Purlin(wind)	L/150
Wall Panel	L/60*
Roof Panel (live)	L/60
Roof Panel (wind)	L/60
Rigid Frame (horizontal)	H/100
Rigid Frame (seismic)	H/100
Rigid Frame (vertical)	L/180
Wind Framing	H/100
Wind Framing (seismic)	H/100

*- If EIFS is attaching to metal panels use L/240

3. BASIC MATERIAL SPECIFICATIONS

3.1. PRIMARY FRAMING STEEL

3.1.1. Steel for Wide-Flange Beams shall conform to the requirements of ASTM Specification A992 Grade 50, with a minimum yield of 50 ksi. Pipe and tube sections shall be of material based on the requirements of ASTM A500 Grade B. All other hot-rolled shapes, including Channels and S-Beams, shall conform to ASTM A-36 or A-572, with a minimum yield of 36 ksi.

3.1.2. Steel for the web portions of built-up sections shall conform to ASTM A-1011 Grade 50 or ASTM A-36 as applicable, with minimum yield of 50 ksi as indicated by the design requirements. The flange portions of built-up sections shall conform to ASTM A-529, with minimum yield of 50 ksi.

3.1.3. Steel for all endwall "C" sections shall conform to the requirements of A-1011 Grade 55. Minimum yield shall be 55 ksi or ASTM A-653 Grade 55, as required by the design specifications.

3.2. SECONDARY FRAMING STEEL

3.2.1. Steel for purlins, girts, eave struts, and "C" sections shall conform to the requirements of ASTM A-1011 Grade 55. Minimum yield shall be 55 ksi.

3.2.2. Steel used to form galvanized purlins, girts, eave struts, and "C" sections shall conform to the requirements of ASTM A-653 G90 Grade 55. Minimum yield shall be 55 ksi.

3.3. ROOF AND WALL PANEL MATERIAL

3.3.1. Panel material specified as 26 gauge (.0185 min.) shall be Galvalume® or Galvalume® Plus material conforming to the requirements of ASTM A792 Grade 80 AZ50 or AZ55. Minimum yield stress shall be 80 ksi (industry standards Grade E.)

3.3.2. Panel material specified as 24 gauge (.023 min.) shall be Galvalume® or Galvalume® Plus material conforming to the requirements of ASTM A792 Grade 50 AZ50 or AZ55. Minimum yield stress shall be 50 ksi (industry standards Grade D.).

3.3.3. Panel material specified as 22 gauge (.029 min.) shall be Galvalume® or Galvalume® Plus material conforming to the requirements of ASTM A792 Grade 50 AZ50or AZ55. Minimum yield stress shall be 50 ksi (industry standards Grade D.).

4. STRUCTURAL FRAMING SPECIFICATIONS

4.1. GENERAL

4.1.1. All framing members shall be shop fabricated for field bolted assembly. The surfaces of the bolted connections shall be smooth and free from burrs or distortions.

4.1.2. All shop-welded connections shall be in accordance with the American Welding Society (AWS) Code for Building Construction. Certification of welder qualifications will be furnished when required and specified in advance.

4.1.3. Visual inspection methods will be used for verification of weld quality as outlined by the AWS Structural Steel Welding Code, *Visual Inspection Acceptance Criteria*, Table 6.1

4.2. PRIMARY FRAMING

4.2.1. Rigid Frame: All rigid frames shall be welded built-up sections or mill shapes as required by design specifications. The built-up columns and rafters may be either constant or tapered depth. Flanges shall be connected to webs by means of a continuous fillet weld on at least one side.

4.2.2. Endwall Frames: All endwall roof beams and endwall columns shall be cold-formed “C” sections, mill-rolled sections, or built-up “I” sections depending on design requirements.

4.2.3. Plates, Stiffeners, etc.: All base plates, splice plates, cap plates, and stiffeners shall be factory welded into place on the structural members.

4.2.4. Bolt Holes: All base plates, splices, and flanges shall be shop fabricated to include bolt connection holes. Webs shall be shop fabricated to include bracing holes.

4.2.5. Connections for secondary structural (purlins and girts) shall be by means of shop welded clips.

4.3. SECONDARY FRAMING

4.3.1. Minimum decimal equivalents for gauges are as follows:

4.3.1.1 16 gauge .056 inch

4.3.1.2 14 gauge .067 inch

4.3.1.3 12 gauge .100 inch

4.3.1.4 10 gauge .128 inch

4.3.2. Purlins and Girts: Purlins and girts shall be cold-formed “Z” sections with stiffened flanges. They shall be prepunched at the factory to provide for field bolting to clips. They shall be flush or by-pass as required by design and the contract documents. Connection bolts will install through the webs.

4.3.3. Eave Struts: Eave Struts shall be unequal flange cold-formed “C” sections.

4.3.4. Base Angle: A base member will be supplied by which the base of the wall covering may be attached to the perimeter of the slab. Base angle shall be secured to the concrete slab with lead nail-in anchors.

4.4. BRACING

4.4.1. Diaphragm Bracing: Additional wind bracing in the walls need not be furnished where it can be shown that the diaphragm strength of the wall covering is adequate to resist the applied wind forces.

4.4.2. Diagonal Bracing: Diagonal bracing in the roof and sidewalls shall be used to remove longitudinal loads (wind, crane, etc.) from the structure. This bracing will be furnished to length and equipped with a bevel washer, flat washer, and nut at each end. It may consist of rods threaded at each end or galvanized cable with suitable threaded-end eyebolts. If load requirements so dictate, bracing may be of structural angle and/or pipe, bolted in place.

4.4.3. Flange Bracing: The compression flange of all primary framing shall be braced laterally with angles connecting to the webs of purlins or girts so that the flange compressive stress is within allowable limits for any combination of loadings.

4.4.4. Special Bracing: When load requirements, or Miller Quality Standards, do not allow panel shear bracing and diagonal bracing is not permitted in the sidewall, a wind bent frame, wind column, or fixed base column(s) will be used.

5. ROOF SYSTEMS

5.1.1. Through-Fastened Panels:

5.1.1.1 Type: Single skin ribbed panels with exposed fasteners.

5.1.1.2 Panel profile(s): PBR; 1-1/4 inch (32 mm) ribs at 12 inch (305 mm) centers, 1/2:12 minimum roof slope.

5.1.1.2.1. Thickness: [26 gauge] [24 gauge] [22 gauge]

5.1.1.2.2. Finish:[Galvalume® Plus] [SMP] [PVDF] [PVDF Metallic]

5.1.1.2.3. Color: [Selected from manufacturer standard colors] [As shown on drawings].

5.1.1.3 Panel Profile(s): [PBU; 3/4 inch (19 mm) ribs at 6 inch (152 mm) centers, 1:12 minimum roof slope.] [7.2; (1-1/2 inch (39 mm) ribs at 7.2 inch centers, 1/2:12 minimum roof slope.]

5.1.1.3.1. Thickness: [26 gauge] [24 gauge] [22 gauge]

5.1.1.3.2. Finish:[Galvalume® Plus] [SMP] [PVDF] [PVDF Metallic]

5.1.1.3.3. Color: [Selected from manufacturer standard colors] [As shown on drawings].

5.1.2. Standing Seam Panels:

5.1.2.1 Type: Single skin panels with concealed clips.

5.1.2.2 Panel profile: Double-Lok:

5.1.2.2.1. Panel Type: Trapezoidal machine seamed, 1/4:12 minimum roof slope.

5.1.2.2.2. Panel width: [24 inches wide x 3 inches high (610 mm wide x 76 mm high)] [24 inches wide x 3 inches high (610 mm wide x 76 mm high)] [18 inches wide x 3 inches high (457 mm wide x 76 mm high)] [12 inches wide x 3 inches high (305 mm wide x 76 mm high)].

5.1.2.2.3. Thickness: [24 gauge] [22 gauge].

5.1.2.2.4. Finish: [Galvalume® Plus] [PVDF] [SMP] [PVDF Metallic].

5.1.2.2.5. Color: [Selected from manufacturer standard colors] [As shown on drawings].

5.1.2.3 Panel profile: Ultra-Dek:

5.1.2.3.1. Panel Type: Trapezoidal snap lock, 1/4:12 minimum roof slope.

5.1.2.3.2. Panel width: [24 inches wide x 3 inches high (610 mm wide x 76 mm high)] [24 inches wide x 3 inches high (610 mm wide x 76 mm high)] [18 inches wide x 3 inches high (457 mm wide x 76 mm high)] [12 inches wide x 3 inches high (305 mm wide x 76 mm high)].

5.1.2.3.3. Thickness: [24 gauge] [22 gauge].

5.1.2.3.4. Finish: [Galvalume® Plus] [PVDF] [SMP] [PVDF Metallic].

5.1.2.3.5. Color: [Selected from manufacturer standard colors] [As shown on drawings].

5.1.2.4 Panel profile: BattenLok HS; vertical leg architectural SSR machine seamed, 1/2:12 minimum roof slope.

5.1.2.4.1. Panel width: [16 inches wide x 2 inches high (406 mm wide x 51 mm high)] [12 inches wide x 2 inches high (305 mm wide x 51 mm high)].

5.1.2.4.2. Seaming Type: Machine seamed.

5.1.2.4.3. Thickness: [24 gauge] [22 gauge].

5.1.2.4.4. Finish: [Galvalume® Plus] [PVDF] [SMP] [PVDF Metallic].

5.1.2.4.5. Color: [Selected from manufacturer standard colors] [As shown on drawings].

6. WALL, LINER , SOFFIT, AND FASCIA PANEL SYSTEMS

6.1.1. Through-Fastened Panels:

6.1.1.1 Panel type: Single skin ribbed panels with exposed fasteners.

6.1.1.2 Panel profiles:

6.1.1.2.1. PBR: 12 inch x 1 inch (305 mm x 25 mm) Rib. 1-1/4 inch (32 mm) ribs x 12 inch (305 mm) centers.

6.1.1.2.2. Reverse Rolled PBR: 1-1/4 inch (32 mm) inverted ribs x 12 inch centers.

6.1.1.2.3. AVP: 1-1/8 inch (28.5 mm) inverted ribs x 12 inch (305 mm) centers.

6.1.1.2.4. PBU: 3/4 inch (19 mm) ribs x 6 inch (152 mm) centers.

6.1.1.2.5. Reverse Rolled PBU: 3/4 inch (19 mm) ribs x 6 inch (152 mm) centers.

6.1.1.2.6. 7.2: 1-1/2 inch (39 mm) ribs x 7.2 inch (183 mm) centers.

6.1.1.3 Thickness: [26 gauge] [24 gauge].

6.1.1.4 Finish: [Galvalume® Plus] [PVDF] [SMP] [PVDF Metallic].

6.1.1.5 Color: [Selected from manufacturer standard colors] [As shown on drawings].

6.1.1.6 Panel fasteners: [Long-life finish] [Stainless steel].

6.1.2. Concealed Fastener Panels:

6.1.2.1 Panel type: Single skin panels with concealed fasteners.

6.1.2.2 Panel Profiles:

6.1.2.2.1. ShadowRib: 16 inches x 3 inches (mm x 76 mm).

6.1.2.2.2. NuWall: 12 inches x 2-1/2 inches (305 mm x 63.5 mm).

6.1.2.2.3. Designer Series: 12 inches x 1-3/4 inch (305 mm x 44.5 mm) flat.

6.1.2.2.4. Designer Series: 16 inches x 1-3/4 inches (406 mm x 44.5 mm) fluted.

6.1.2.2.5. Artisan Panel: 12 inches x 1 inch (305 mm x 25 mm); soffits or interior liner only.

6.1.2.3 Thickness: [26 gauge] [24 gauge] [22 gauge].

6.1.2.4 Finish: [Galvalume® Plus] [PVDF] [SMP] [PVDF Metallic].

6.1.2.5 Color: [Selected from manufacturer standard colors] [As shown on drawings].

7. MISCELLANEOUS MATERIAL SPECIFICATIONS

7.1. FASTENERS

7.1.1. Structural Bolts:

7.1.1.1 All bolts used in frame splices shall be bare ASTM A325 or A325T. The nuts used shall comply with ASTM 563, and the washers shall comply with ASTM A436.

7.1.1.2 All bolts used in connections of secondary framing to primary framing shall be bare ANSI Grade 2, ASTM A307. The nuts used shall comply with ASTM 563, and the washers shall comply with ASTM 844.

7.1.2. Fasteners for Roof Panels: All panels shall be attached to the secondary framing members by means of #12-14 x 1-1/2” self-drilling structural carbon steel screws with a long-life zinc-alloy head, with or without paint, assembled with an EPDM washer. These fasteners are applicable for use with fiberglass blanket insulation up to 6” thick. If no roof insulation is present, #12 x 1 self-drilling screws with a long-life zinc alloy head and EPDM washers will be used. All self-drilling lap screws are ¼”-14 x 7/8” with a long-life zinc alloy head and EPDM washer, regardless of structural screw length.

7.1.3. Fasteners for Wall Panels: Wall panels shall be attached to the secondary framing members by means of a self-drilling fastener made of carbon steel, #12 x 1-1/2” hex washer head with EPDM washers for fiberglass insulation up to 6” thick. If no wall insulation is present, #12 x 3/4” hex washer head screws with EPDM washers will be used. Screws for panel laps shall be with self-drilling ¼”-14 x 7/8” hex washer head with EPDM washers.

7.1.4. Fasteners for Standing Seam roof systems shall be as recommended by the roof manufacturer.

7.1.5. Blind Fasteners: All blind fasteners shall be stainless steel 1/8” diameter with a grip range of .126-.187.

7.1.6. Anchor Bolts: All anchor Bolts shall comply with ASTM F1554.

7.2. PANEL CLIPS

7.2.1. Panel clips shall be as supplied and recommended by the roof manufacturer. The panel clip to be provided shall be as specified in the contract documents.

7.3. SEALANTS AND CLOSURES

7.3.1. Closure Strips: The corrugations of the roof and wall panels shall be filled with solid or closed-cell, preformed rubber, neoprene or polyethylene closures where required.

7.3.1. Metal Closures: Metal closures for standing seam roof systems shall be as recommended and supplied by the roof manufacturer.

7.3.2. Sealants: Roof panels shall be sealed as indicated in the Construction Handbook with 1/2" x 3/32" tape sealer. The material shall be a butyl base elastic compound with a minimum solid content of 99%, Schnee-Morehead #5227 or equal. The sealer shall have good adhesion to metal and be non-staining, non-corrosive, non-shrinking, non-oxidizing, nontoxic and non-volatile. The service temperature shall be from -40° F to +180° F.

7.3.3. Caulk: Caulk shall be gray or clear pigmented caulk of polyurethane base, equivalent to Schnee-Morehead SM7100. The caulk shall comply with ASTM C-920 Type S, Grade NS, Class 25, Use-NT, A, M, G & O.

7.4. GUTTER, FLASHING & DOWNSPOUTS

7.4.1. Gutters and Flashing: Gutters and rake shall be 26 (.0185 min.) gauge Galvalume or Galvalume Plus steel conforming to ASTM A792 Grade 50 AZ50 or AZ55 with a minimum yield of 50 ksi (industry standards Grade D).

7.4.2. Downspouts: All downspouts shall be rectangular in shape and shall be 26 gauge (.0185 min.) Galvalume or Galvalume Plus steel conforming to ASTM A792 Grade 50 AZ50 or AZ55 with a minimum yield of 50 ksi (industry standards Grade D).

8. PAINTING

8.1. STRUCTURAL PAINTING

8.1.1. All uncoated structural steel shall be cleaned and primed as required by the Society for Protective Coatings (SSPC) specifications as follows:

8.1.1.1 Steel preparation specification: SSPC-SP 2

8.1.2. Primer specification: SSPC-Paint 15 with the additional requirements:

8.1.2.1 Type of Coating Used: High solids, low VOC Shop coat primer

8.1.2.2 Standard Color: Red Oxide

8.1.2.3 Maximum VOC: 3.33

8.1.2.4 Minimum Thickness

8.1.2.4.1. Wet: 3.6 mils

8.1.2.4.2. Dry: 1.7 mils

8.1.2.5 Dry to Touch: 30 minutes @ 77° F

8.1.3. Pre-coated cold-form members shall be cleaned according to SSPC-SP 8 or SSPC-SP 6, and then chemically pretreated before being coated with a minimum of .5 mils of polyester-based red primer. The primer contains a "wax" type lubricant to facilitate roll-forming and deter marring during these operations. Hairline crazing, which may occur during forming operations, is considered normal. Special preparation is required before a finish coat can be applied over this "wax" finish.

Note: Primer systems are not intended as finish coat paint systems and do not offer the uniformity of appearance, durability or corrosion resistance of a top coat applied over a primer. Primers are designed to promote the wetting action and adhesion of a top coat and offer only short-term corrosion protection from ordinary atmospheric exposure. Primer is compatible only for top coating with solvent-based alkyd and modified alkyd top coat paints. Abrasions caused by handling after painting as well as the flaking of tight mill scale are to be expected. Primer shall be furnished to touch-up or field painting as specified in the contract documents.

8.2. PAINTED PANELS

8.2.1. The panel finish shall be either Siliconized Polyester, or 70% Fluoropolymer system as specified in the contract documents.

8.2.1.1 Both coatings have the following specifications:

8.2.1.1.1. Specular gloss – ASTM D523 – 25-50° at 60° viewing (70% Fluoropolymer – 25-50° at 60° viewing)

8.2.1.1.2. Abrasion resistance – ASTM D968 – 30 liters (70% Fluoropolymer – 50 liters)

8.2.1.1.3. Humidity Resistance – ASTM D2247 (70% Fluoropolymer system is additionally covered by ASTM D714) – 1000 hours with no more than 10% showing #8 size blister (70% Fluoropolymer – no more than 5% showing #8 size blister

8.2.1.1.4. Salt Spray Resistance – ASTM B117 (70% Fluoropolymer system is additionally covered by ASTM D714) – 1,000 hours in 5% salt fog at 95% humidity with no more than 1/16" (70% Fluoropolymer – no more than 1/8" average) creepage or loss of adhesion from scribed line and few blister no larger than #8

8.2.1.1.5. Weatherometer Test – ASTM D822 & G23 – 2,000 hours exposure

8.2.1.1.6. Post-Formability – D522 – 180˚ bend around 1/8" mandrel (with siliconized polyester system, slight microfracturing is acceptable)

8.2.1.1.7. Pencil Hardness:

7.2.1.1.7.1. Siliconized Polyester system – ASTM D3363 – F-2H

7.2.1.1.7.2. 70% Fluoropolymer system – ASTM D3363 – HB-Min

8.2.1.1.8. Adhesion:

7.2.1.1.8.1. Siliconized Polyester system – ASTM D2794 – No loss of adhesion between coating and substrate after 80"# impact over .019" minimum

7.2.1.1.8.2. 70% Fluoropolymer system – ASTM D3359 – No removal of finish after 1/16" cross-hatching to bare metal, to impact limits or point of metal rupture

8.2.1.2 Painted Panel Warranty available upon request.

8.2.1.3 Topcoat dry film thickness shall be a minimum of .8 mils.

8.2.2. Interior Finish: The interior finish shall have a white or parchment top coat over epoxy primer or an epoxy base coat, white or parchment, with a clear polyester top coat.

9. ACCESSORIES

9.1. WINDOWS

9.1.1. Standard Windows shall be horizontal slide units, white aluminum finish 3'-0" x 3'-0", 4'-0" x 3'-0", and 6'-0" x 3'-0". They shall be furnished complete with hardware and half screen. All windows provided by Miller shall comply with the following:

9.1.1.1 Insulated glass shall have an "A" level rating with a five (5) warranty against seal failure.

9.1.1.2 All glass shall be inside glazed and have a minimum glaing rabbet of 3/8".

9.1.1.3 Glass lites shall be glazed with a neutral cure liquid silicone back bedding compound not less than .040".

9.2. PERSONNEL DOORS

9.2.1. Personnel door skin to be manufactured from 20 gauge galvanized steel (A40) with laser welded seam.

9.2.2. Door leafs to hae 16 ga. steel channels forming the top and bottom end closures (flush mounted top)

9.2.3. Door leafs shall have an insulated polystyrene core.

9.2.4. Door faces are smooth and have a straight lock edge (non-beveled).

9.2.5. Door leafs shall have a finish coat baked on white paint.

9.2.6. Door leafs shall have hinge reinforcements of 10 gauge steel mortised for a 4 ½"x4 ½" standard weight hinge.

9.2.7. Door leafs shall have lock and closure reinforcements of 14 gauge steel.

9.2.8. Door leafs shall be reinforced for applicable hardware.

9.2.9. Door leafs shall be solid, 20"x24" glass, or 4"x48" side vision.

9.2.10. All glazing to be factory installed.

9.2.11. Door frames shall be 16 gauge galvanized steel (A40), with 10 gauge steel hinge reinforcements

9.2.12. Door sub frames shall be 16 gauge galvanized steel (A40 min) with a 1 ¾" flanges, a height of 7'-2 and width to match the girt depth.

10. ERECTION AND INSTALLATION

10.1. Building erection and the installation of accessories shall be performed in accordance with the erection drawings by the qualified erector using proper tools and equipment. Erection practices shall conform to MBMA's Metal Building Systems Manual 2002 ed., part IV Common Industry practices, Sections 5-6.

10.2. There shall be no field modifications to primary structural members except as authorized and specified in writing by Miller Buildings.

11. BUILDING ANCHORAGE AND FOUNDATION

11.1. The building anchor bolts shall be designed to resist the maximum column reactions resulting from the specified combinations of loading. These designs and loading shall be specified by Miller. Anchor rod will not be supplied by Miller.

11.2. Foundations shall be adequately designed by a qualified foundation engineer to support the building reactions and other loads that may be imposed by the building use. The design shall be based on the specific soil conditions of the building site. The engineering of the foundation is not provided by Miller. Miller assumes no responsibility for the integrity of the foundation.

12. WARRANTIES

12.1. Miller Buildings, Inc offers a variety of warranties for panel coatings, roof system weathertightness, purchased products, and manufactured materials. For specific warranty details and cost contact Miller Buildings, Inc at 1.717.866.2319.