

1. GENERAL

1.1 Scope

- 1.1.1 These specifications delineate the design criteria, material quality and fabrication processes used in metal building systems designed, manufactured and furnished by **Robertson Building Systems**, (herein after referred to as **Robertson**.)
- 1.1.2 These specifications are intended for use as an outline of the performance requirements for the various materials used within **Robertson** metal building systems. They are further intended to ensure that architects, engineers, builders and owners understand the basis for design, manufacture and application of these materials.
- 1.1.3 Engineering and mechanical properties of materials utilized by **Robertson** in its product line are provided or referenced within these specifications, as are industry specification standards, where applicable.
- 1.1.4 **Robertson** utilizes those standards, specifications, interpretations and recommendations of professionally recognized groups and agencies, such as MBMA, AISC, AISI, AWS, ASTM, CSA, CWB, CISC, etc. as the basis in establishing its own design, fabrication and quality criteria, standards, practices, methods and tolerances. For convenience, certain provisions of a specification and/or recommendation of one of these groups or agencies (i.e. AISC, AISI, etc.) may be referenced, where appropriate, in **Robertson** documents.

In all cases however, unless stipulated otherwise in the contract documents, Robertson's design, fabrication and quality criteria, standards, practices, methods and tolerances will govern the work.

Robertson is certified to CSA A660 and IAS - AC472.

- 1.1.5 These specifications are subject to change without notice due to **Robertson's** policy of continuous product development and improvement and possible changes in material availability.

1.2 Materials Included

- 1.2.1 Standard materials furnished for **Robertson** metal building systems will include primary and secondary structural steel framing members, bracing, metal panels for roofing and siding, flashings, fasteners, sealants, accessories and all other miscellaneous component parts required for a complete building (with the exception of anchor rods and other embedded items, which are excluded). Insulation and other specific items beyond the scope of standard material will also be furnished if shown or called for by contract documents.

1.3 Drawings and Calculations

- 1.3.1 **Robertson** will provide erection information and drawings as required to assemble all parts, components and accessories furnished by **Robertson**. Drawings will include anchor rod setting plans, roof framing plan, wall framing elevations, cross-sections, etc.

1.3.2 **Robertson** will supply column reactions for use in designing foundations for the building however, **Robertson** will not be responsible for the design nor the adequacy of the foundation.

1.3.3 If required by the contract documents, **Robertson** will furnish design calculations or a letter of design certification for the structural framing and covering panels of the metal building system. A letter of certification will be signed and sealed by a registered professional engineer who is licensed in the State or Province where the building is located. At the discretion of **Robertson**, design calculations may be computer-generated or prepared manually.

1.4 **Building Nomenclature**

1.4.1 The building width will be measured from side wall steel line to the opposite side wall steel line. The building length will be measured from end wall steel line to the opposite end wall steel line. (Steel line for the walls is the exterior face of the wall girts.)

1.4.2 The building eave height will be measured from the underside of the base plate to top of the eave strut. The top of the eave strut is the point of intersection between the side wall steel line and the roof steel line. (Steel line for the roof is the top face of the roof purlins.)

1.4.3 The bay spacing will be measured as follows:

- a. Interior bays: from center-line to center-line of interior frames.
- b. End bays: from end wall steel line to center-line of first interior frame.

1.5 **Building Description**

1.5.1 **Robertson Buildings** are designed to meet the exact requirements of the customer therefore the information listed below must be included in the contract documents, in order to fully specify the building. **The RBS order file will be the primary contract document used to define an order.**

- a. Size (width, length, eave height).
- b. Roof slope
- c. Primary frame type (see below).
- d. Expandable or non-expandable end walls.
- e. Side and end wall girt type (see Primary Frame and End Frame types).
- f. Bay spacing for interior bays and end bays, specified to nearest 1/16".
- g. Building location including City, County and State or Province.
- h. Building Code to be used.

i. Design loads:

- American projects:

- Live load
- Roof or Ground Snow Load
- Snow Exposure (Fully Exposed, Partially Exposed, Sheltered)
- Collateral load
- Wind speed and exposure
- Seismic values
- Site Class/Soil Type
- Occupancy (I – Low Hazard, II – Normal, III – High Occupancy, IV – Essential)
- Thermal Condition (Heated, Unheated, Above Freezing)
- Crane data
- Roof Top Unit data
- Mezzanine data

- Canadian projects:

- Roof or Ground Snow Load
- Snow Exposure (Normal Exposure, Exposed Location, North of Tree Line)
- Rain load
- Collateral load
- Wind load
- Seismic values
- Site Class/Soil Type
- Importance Category (Low Occupancy, Normal Occupancy, High Occupancy, Post Disaster)
- Crane data
- Roof Top Unit data
- Mezzanine data

j. Information on attached and adjacent structures or future structures and/or expansion.

k. Serviceability requirements (deflections).

1.6 Primary Frame Types:

1.6.1 a. Rigid Frame Clear Span:

Primary frames will be a bolted rigid frame design, clear span type, with gable roof and pin base columns**. Columns will be either tapered or straight as specified. Rafters will be variable or parallel depth.

b. Rigid Frame Multi-Span:

Primary frames will be a bolted rigid frame design, multi-span type (****number of spans to be specified***), with gable roof, pin base side wall columns** and rafter supported at intervals (****intervals to be specified***) by interior columns, typically HSS tubes. Interior columns may also be fabricated from pipes, built-up plate or hot-rolled members. Interior columns will be recessed 5" below floor, unless noted otherwise. Side wall columns will be either tapered or straight as specified. Rafters will be variable or parallel depth.

c. Single Slope Clear Span:

Primary frames will be a bolted rigid frame design, clear span type, with single slope roof and pin base columns**. Columns will be either tapered or straight as specified. Rafters will be variable or parallel depth.

d. Single Slope Multi-Span:

Primary frames will be a bolted rigid frame design, multi-span type (****number of spans to be specified****), with single slope roof, pin base side wall columns** and rafter supported at intervals (****intervals to be specified****) by interior columns, typically HSS tubes. Interior columns may also be fabricated from pipes, built-up plate or hot-rolled members. Interior columns will be recessed 5" below floor, unless noted otherwise. Side wall columns will be either tapered or straight as specified. Rafters will be variable or parallel depth.

e. Lean-to:

Primary frames will be a post and beam design with high side of frame connected to and supported by the main building. Frame will be a clear span type with single slope roof. Columns and rafters are pinned at both ends. Columns will be straight sections. Rafter will be either a tapered beam or beam with parallel flanges as required by design.

- 1.6.2 Girts for all Primary Frame types will be either by-pass (exterior), inset or flush in relation to the outside face of the frame columns.

** Column bases for all frame types may be "fixed" or moment resisting if required by design.

1.7 End Frame Types

1.7.1 a. Bearing End Frame - Hot Rolled or Built-Up Plate (BFEW):

This type of end frame will be a post and beam design with rafter pin-connected at corner posts but continuous over, and supported by, end wall posts spaced at intervals along the end wall. Corner posts and end wall posts will be designed as being pinned both ends. Rafter, corner posts and end wall posts will be either hot-rolled mill sections or welded-up, "H"-shaped, straight sections. Positive bracing is required for this type of end wall, typically cross-rod bracing.

b. Rigid End Frame (Full Load or FFEW):

End frames will be a bolted rigid frame design of same type and design as Primary Frames in the building. End posts will be furnished to provide support for girts, if a sheeted end wall is specified. End posts will be either hot-rolled mill sections or welded-up, "H"-shaped, straight sections. The End Frame is designed for future expansion. (****Future bay space must be specified.****)

c. Rigid End Frame (Half Load or NEFF):

End Frames will be a bolted rigid frame design of same type and design as Primary Frames in the building, but will be designed for only half-bay loading. End posts will be furnished to provide support for girts, if a sheeted end wall is specified. End posts will be either hot-rolled mill sections or welded-up, "H"-shaped, straight sections.

- 1.7.2 Girts for all End Frame types will be either by-pass (exterior), inset or flush in relation to the outside face of the End Frame posts.

2. DESIGN

2.1 General

2.1.1 All structural steel mill sections and welded plate members will be designed in accordance with the applicable sections, relating to design requirements and allowable stresses:

- **American projects:** American Institute of Steel Construction (AISC) "Specification for Structural Steel Buildings, Allowable Stress Design and Plastic Design".

- **Canadian projects:** CSA S16.1.

2.1.2 All light-gauge, cold formed, structural members and covering will be designed in accordance with the applicable sections, relating to design requirements and allowable stresses:

- **American projects:** American Iron and Steel Institute (AISI) "Specification for the Design of Cold Formed Steel Structural Members."

- **Canadian projects:** CSA 136-01 "North American Code for Design of Cold Formed Steel Structural Members".

2.2 Design Loads

2.2.1 Design load requirements will be determined by local conditions, applicable codes, building end use, etc. Magnitude of design loads will be specified by the contract documents. Application of design loads will be in accordance with:

- **American projects:** Design Practices sections of the Metal Building Manufacturers Association (MBMA) 1996 "Low Rise Building Systems Manual", unless specified otherwise.

- **Canadian projects:** applicable National and/or Provincial Building Code, unless specified otherwise.

2.2.2 Loads to be considered are defined as follows:

a. Dead Load: the weight of the building system materials.

b. Collateral Loads: the weight of additional permanent materials, other than the building system, such as sprinklers, mechanical and/or electrical systems, partitions, and ceilings.

c. Roof Live Loads: loads that are produced 1) during maintenance by workers, equipment and materials and 2) during the life of the structure by movable objects. Live loads do not include snow, wind, seismic or collateral loads.

d. Roof Snow Loads: the vertical load induced by the weight of snow, assumed to act on the horizontal projection of the roof of the structure as specified by the Code and contract documents for building location and relevant parameters.

e. Wind Loads: the load caused by wind blowing from any horizontal direction.

f. Seismic Loads: the lateral load due to the action of an earthquake acting on the structure in any horizontal direction.

g. Auxiliary loads: dynamic live loads such as those induced by cranes and material handling systems.

h. Floor Live Loads: those loads induced on a floor system by the use and occupancy of the building.

2.2.3 Unless otherwise specified, load combinations will be those listed in the specified Building Code and/or other relevant standards, such as Design Practices section of the MBMA 1996 "Low Rise Building Systems Manual."

3. STRUCTURAL FRAMING

3.1 General

3.1.1 All primary steel framing members will be cleaned to remove loose rust and mill scale, and given one shop coat. Shop coat will be formulated to equal or exceed, under laboratory conditions, performance requirements of:

- **American projects:** U.S. Federal Specification TTP-636

- **Canadian projects:** 2-75 Structural Primer

The shop coat thickness will be an average of one mil. Shop coat is only intended to provide temporary protection during transportation and erection.

3.1.2 Secondary structural steel framing will be cold-formed using prime painted coil stock.

3.1.3 In compliance with the 2001 ASTM Standards for Metal Building Systems, all references in the Product Manual to ASTM A-570 and ASTM A-607 should be regarded as references to ASTM A-1011-SS and ASTM A-1011-HSLAS respectively.

3.2 Primary Members

3.2.1 Primary structural steel framing will refer to the Primary Frames (transverse rigid frames and lean-to rafters/columns), expandable and non-expandable End Frames (rafters/corner posts/end posts), Wind/Seismic Bracing and Crane Systems.

a. Sheet, plate, strip mill plate, plate coils and flat bar stock used to fabricate welded-up, structural members will conform to one of the following ASTM specifications as appropriate: ASTM A-572, Grade 50; ASTM A-529, Grade 50; ASTM A-1011-HSLAS, Grade 50, Class 1; CSA G40.21 GR50W.

b. Members fabricated from W-shapes (hot-rolled structural sections) will conform to one of the following ASTM specifications: ASTM A-529, Gr. 50; ASTM A-572, Grade 50 or ASTM A-992, Grade 50.

c. Members fabricated from other hot-rolled structural sections (S-shapes, American Standard channels, angles, rods for anchor bolts and all other miscellaneous structural shapes) will conform to ASTM A-529, Grade 50 or ASTM A-572, Grade 50.

d. Interior columns of multi-span frames will be fabricated from HSS tube column sections which have minimum yield strength of 46,000 psi and conform to physical specifications of ASTM A-500, Grade B or CSA G40.21 GR50W.

e. Rods used for bracing will conform to the physical specifications of ASTM A572, Gr. 50 or CSA G40.21 GR50W.

f. Members fabricated by cold forming process will conform to ASTM specification ASTM A-1011, Grade 55 or ASTM A-1011-HSLAS, Grade 55, Class 1.

3.3 Secondary Members

3.3.1 Secondary structural steel framing will refer to purlins, girts, eave struts, base members, flange bracing, gable angles, clips and other miscellaneous structural parts.

3.3.2 Purlins, girts, eave struts, base members and gable angles will be cold-formed from steel conforming to ASTM specification A-1011, SS, Grade 55 or ASTM A-1011-HSLAS, Grade 55, Class 1.

a. Purlins are Zee-sections 8 1/2", 10" or 12" deep. Each flange of these Zees has a stiffening lip formed at 50° to the flange.

b. Girts are either Zee- or Cee-sections 8 1/2" or 10" deep. Each flange of these members has a stiffening lip formed at 50° to the flange on Zees and at 90° on Cees.

c. Eave struts are Cee-sections 8 1/2", 10" or 12" deep with the top flange wider than the bottom flange. Flanges are formed at angles other than 90° to the web to accommodate various roof slopes. Each flange has a stiffening lip formed at 90° to the flange.

3.3.3 All other miscellaneous secondary steel framing members will have minimum yield strength of 36,000 psi.

3.4 Connections

3.4.1 All field connections will be bolted, unless otherwise noted.

a. All primary bolted connections will be furnished with high strength bolts conforming to ASTM specification ASTM A-325 or A490.

b. All secondary bolted connections will be furnished with machine bolts conforming to ASTM specification ASTM A-307 or equivalent, unless ASTM A-325 bolts are required by design.

c. The standard A307 and A325 bolts will be uncoated. Special coatings in conformance with ASTM specifications are available by special order.

d. All connections using machine bolts in conformance with ASTM A-307 will use nuts conforming to ASTM specification ASTM A-563 Grade A Hex. Connections using high strength bolts in conformance with ASTM A-325 will use nuts in conformance with ASTM specification ASTM A-563 Grade C Heavy Hex.

e. All cast iron slope washers will conform to ASTM specification A-48 Class 30 B.

f. Hardened steel washers in conformance with ASTM specification ASTM F-436, Type 1 carbon steel are available by special order.

3.4.2 All shop welding will be by either the submerged arc or shielded arc process. Groove joint welds will develop the full strength of the members connected. Welding will conform to the applicable requirements of:

- **American projects:** the American Welding Society "Structural Welding Code," (AWS D1.1)

- **Canadian projects:** CSA W59, W47.1.

4. ROOF AND WALL CLADDING

4.1 General

4.1.1 Standard coverings for roofs, using exposed fasteners, are Dura-Rib® and MBCI PBR ribbed-type panels having 36" net coverage. These panels will be 26 or 24 gauge Galvalume Plus® steel, with or without a color coating. At **Robertson's** option, substrate for color coated panels may be galvanized steel sheet in lieu of Galvalume Plus®.

4.1.2 Premium coverings for roofs, with no exposed fasteners, are SSR and MBCI Double-Lok® or Ultra-Dek® standing seam panels having 24" net coverage. These panels will be 24 gauge Galvalume Plus® steel, with or without a color coating.

4.1.3 Optional premium coverings for roofs are MBCI LokSeam®, BattenLok® HS and SuperLok® architectural standing seam panel having 16" net coverage. These panels will be 24 gauge Galvalume Plus® steel, with or without a color coating. These panels are fabricated with striations.

4.1.4 Optional premium covering for roofs is RWP roof panel (or equivalent) having 36" net coverage. The exterior skin of these panels will be 26 or 24 gauge galvanized steel material with a Signature 200 or 300 color coating. The interior skin will be 26 gauge embossed galvanized steel material with a white Signature® 200 coating.

4.1.5 Standard coverings for walls are Dura-Rib® and MBCI PBR panels or A-36 and MBCI PBA architectural panels having 36" net coverage. These panels will be 26 or 24 gauge Galvalume Plus® steel, with or without a color coating. At **Robertson's** option, substrate for color coated panels may be galvanized steel sheet in lieu of Galvalume Plus®. Steel coil with an embossed finish is also available as an option for the MBCI panels. The PBA panel is fabricated with striations as a standard.

- 4.1.6 Premium covering for walls is ShadowRib Concealed Fastener wall panel having 16" net coverage. These panels will be 24 gauge Galvalume Plus® steel, with or without a color coating. Steel coil with an embossed finish is also available as an option.
- 4.1.7 Optional premium covering for walls is ESP Concealed Fastener wall panel (or equivalent) having 36" or 42" net coverage. The exterior skin of these panels will be 24 gauge embossed galvanized steel material with a Signature® 200 or 300 color coating. The interior skin will be 26 gauge embossed galvanized steel material with a white Signature® 200 coating.
- 4.1.8 Panels will be precision roll-formed to the required configuration specified under Section 4.3.
- 4.1.9 Roof and wall panels of other materials and thicknesses are available upon request
- 4.1.10 The most frequently used **Robertson** profiles are shown. Many other profiles are available.

4.2 Panel Materials

- 4.2.1 Galvanized is a corrosion resistant zinc coating applied by a hot dip galvanization process. Galvanized panels will conform to ASTM specification ASTM A-653, Grade 50 with coating weight G90 or Z-275. Grade 80 may be used as specified under item 4.3.3.
- 4.2.2 Galvalume® is a specialty steel sheet product with a patented coating of corrosion resistant, aluminum-zinc alloy applied by a continuous hot dipping process. Galvalume® steel panels will have minimum yield strength of 50,000 psi, unless otherwise specified under Item 4.3.3. (b) & (c). Galvalume® steel will conform to ASTM specification A-792, Grade 50, SS Class 2 with coating weight AZ55 for bare Galvalume® and AZ50 for painted Galvalume®. Grade 80 may be used as specified under item 4.3.3.
- 4.2.3 Acrylic coated Galvalume® (Also referred to as Galvalume Plus® and Acrylume®) is a bare Galvalume® sheet product with a thin, clear acrylic coating applied to both sides of the sheet. This panel conforms to ASTM specification A-792, grade 50. Acrylic coated Galvalume® resists fingerprinting and smudging during handling and installation.
- 4.2.4 **Standard Paint**, color coated panels will have the exterior side finished with a siliconized polyester coating system applied over Galvalume Plus® or galvanized steel substrate. Surfaces will be properly prepared and primed, then coated and oven-baked to cure. Top coating system will have a dry film thickness of 0.70 to 0.90 mils. Specular gloss at 60° viewing angle will be 25 to 40. The interior side of these panels will be protected by a wash coat of primer. Panels will be coated prior to roll forming.
- 4.2.5 **Premium Paint**, color coated panels will have the exterior side finished with an extended life, polyvinylidene fluoride coating utilizing Kynar 500 Resin. This coating will be applied over a Galvalume Plus® or galvanized steel substrate. Surfaces will be properly prepared and primed, then coated and oven-baked to cure. Top coating system will have a dry film thickness of 0.75 to 0.90 mils. Specular gloss at 60° viewing angle will be 35± 5%. The interior side of these panels will be protected by a back coat system of .60 ± .05 mils thickness. Panels will be coated prior to roll forming.

4.3 Panel Configurations and Finishes

4.3.1 Ribbed Roof Panels will be as follows:

a. Dura-Rib® will have 1 1/8" deep major ribs which taper in width from 7/8" to 3 1/2" and are spaced 12" on center. Between each major rib are two minor stiffening ribs. The "leading edge" rib has a bearing leg. Each panel will provide 36" of lateral coverage. Panel finish will be either Galvalume Plus® or painted. Refer to color charts for standard paint colors available. Steel sheet for these panels will have minimum yield strength of 80,000 psi or 50,000 psi if color coated.

NOTE: Dura-Rib® has achieved UL90 Listing.

b. MBCI PBR will have 1 1/4" deep major ribs which taper in width from 1" to 3 1/8" and are spaced 12" on center. Between each major rib are two minor stiffening ribs. The "leading edge" rib has a bearing leg. Each panel will provide 36" of lateral coverage. Panel finish will be either Galvalume Plus® or painted. Refer to color charts for standard paint colors available. Steel sheet for these panels will have minimum yield strength of 80,000 psi or 50,000 psi depending on finish and thickness of steel.

NOTE: MBCI PBR has achieved UL90 Listing.

4.3.2 Standing Seam Roof Panels will be as follows:

a. SSR Standing Seam Roof Panel will be roll-formed 24" wide. Each edge corrugation will be one half of a major rib and will have a standing leg on top of the half rib that interlocks with the adjacent panel. Edge corrugation will be 2" high (2 7/8" including the standing leg). All major ribs will taper in from 1" at top to 4 1/4" at base. The panel flat will be embossed with cross ribs at 6" on center.

Interlocking standing legs at side laps will be field seamed together into a Pittsburgh double fold lock joint by use of an electric seaming machine obtained from **Robertson**. Factory applied sealant will be provided in the overlapping standing seam leg to assure weather-tightness of the seamed joint. Concealed clips, which are seamed into the panel side lap, will be furnished by **Robertson** to fasten panels to structural members. Panels will be factory pre-notched for correct make-up at end laps.

Each panel will provide 24" coverage. Panel finish will be Galvalume Plus®. Refer to color charts for Standard and Premium paint colors available.

NOTE: SSR has achieved UL90 Listing, has passed the American Society of Testing and Materials (ASTM) E1592 test and has been approved by Factory Mutual as a Class 1 roof panel.

b. MBCI Double-Lok® Standing Seam Roof Panel will be roll-formed 24" wide. Each edge corrugation will be one half of a major rib and will have a standing leg on top of the half rib that interlocks with the adjacent panel. Edge corrugation will be 2" high (3" including the standing leg). All major ribs will taper in from 1" at top to 4 1/2" at base. The panel flat will be embossed with ribs at 8 1/2" - 7" - 8 1/2" on center.

Interlocking standing legs at side laps will be field seamed together into a Pittsburgh double fold lock joint by use of an electric seaming machine obtained from **Robertson**. Factory applied sealant will be provided in the overlapping standing seam leg to assure weather-tightness of the seamed joint. Concealed clips, which are seamed into the panel side lap, will be furnished by **Robertson** to fasten panels to structural members. Panels will be factory pre-notched for correct make-up at end laps.

Each panel will provide 24" coverage. Panel finish will be Galvalume Plus®. Refer to color charts for Standard and Premium paint colors available.

NOTE: MBCI Double-Lok® has achieved UL90 Listing, has passed the American Society of Testing and Materials (ASTM) E1592 test and has been approved by Factory Mutual as a Class 1 roof panel.

c. MBCI Ultra-Dek® Standing Seam Roof Panel will be roll-formed 24" wide. Each edge corrugation will be one half of a major rib and will have a standing leg on top of the half rib that interlocks with the adjacent panel. Edge corrugation will be 2" high (3" including the standing leg). All major ribs will taper in from 1" at top to 4 1/2" at base. The panel flat will be embossed with ribs at 8 1/2" – 7" – 8 1/2" on center.

Interlocking standing legs at side laps will be snapped together without the need for a seaming machine. Factory applied sealant will be provided in the overlapping standing seam leg to assure weather-tightness of the seamed joint. Concealed clips, which are crimped into the panel side lap, will be furnished by **Robertson** to fasten panels to structural members. Panels will be factory pre-notched for correct make-up at end laps.

Each panel will provide 24" coverage. Panel finish will be Galvalume Plus®. Refer to color charts for Standard and Premium paint colors available.

NOTE: MBCI Ultra-Dek® has achieved UL90 Listing, has passed the American Society of Testing and Materials (ASTM) E1592 test and has been approved by Factory Mutual as a Class 1 roof panel.

d. LokSeam® Vertical Leg Standing Seam Roof Panel will be roll-formed 18" wide with a 1 3/4" high straight rib at each edge. One edge rib shall have a male flange at its top and the other edge rib shall have a female flange. This design allows a friction interlock of male/female ribs on adjacent panels. At end laps the end of the overlapping panel shall be factory swaged to allow nesting with the bottom panel.

Interlocking straight ribs at side laps shall be snapped together. Factory applied sealant shall be provided in the overlapping female flange to assure weathertightness of the continuously crimped joint. Concealed clips, which are crimped into the panel side laps, shall be furnished by **Robertson** to fasten panels to structural members.

Each panel shall provide 18" coverage. Surface texture of panel may be specified as smooth or embossed. Finish may be specified as either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available.

NOTE: MBCI LokSeam® HS has achieved UL90 Listing and passed the ASTM E1592 test.

e. BattenLok® HS Vertical Leg Standing Seam Roof Panel will be roll-formed 16" wide with a 2" high straight rib at each edge. One edge rib shall have a male flange at its top and the other edge rib shall have a female flange. This design allows a friction interlock of male/female ribs on adjacent panels. At end laps the end of the overlapping panel shall be factory swaged to allow nesting with the bottom panel.

Interlocking straight ribs at side laps shall be field crimped together by the use of an electric seaming tool obtained from **Robertson**. Factory applied sealant shall be provided in the overlapping female flange to assure weathertightness of the continuously crimped joint. Concealed clips, which are crimped into the panel side laps, shall be furnished by **Robertson** to fasten panels to structural members.

Each panel shall provide 16" coverage. Surface texture of panel may be specified as smooth or embossed. Finish may be specified as either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available.

NOTE: BattenLok® HS has achieved UL90 Listing and passed the ASTM E1592 test.

f. SuperLok® Vertical Leg Standing Seam Roof Panel will be roll-formed 16" wide with a 2" high straight rib at each edge. One edge rib shall have a male flange at its top and the other edge rib shall have a female flange. This design allows a friction interlock of male/female ribs on adjacent panels. At end laps the end of the overlapping panel shall be factory swaged to allow nesting with the bottom panel.

Interlocking straight ribs at side laps shall be field crimped together by the use of an electric seaming tool obtained from **Robertson** to create a slim vertical rib. Factory applied sealant shall be provided in the overlapping female flange to assure weathertightness of the continuously crimped joint. Concealed clips, which are crimped into the panel side laps, shall be furnished by **Robertson** to fasten panels to structural members.

Each panel shall provide 16" coverage. Surface texture of panel may be specified as smooth or embossed. Finish may be specified as either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available.

NOTE: MBCI SuperLok® HS has achieved UL90 Listing and passed the ASTM E1592 test.

4.3.3 Insulated Roof Panels will be as follows

a. RWP Roof Panel is a 36" wide factory insulated sandwich roof panel system consisting of steel skins chemically bonded to a polyurethane foam core. 1.5", 2", 2.5", 3", 4" & 5" thick panels are available, measured from the panel flat surfaces. The panel has 1-1/4" high ribs at 12" on center on the exterior skin. The exterior skin is available in 26 or 24 gauge material. The interior skin is 26 gauge white embossed flat material with shallow planks. Each panel will provide 36" coverage. Refer to color charts for Standard and Premium paint colors available.

b. Robertson RTS Roof System is a field-assembled sandwich roof panel system consisting of a metal liner panel, unfaced batt insulation and a ribbed or standing seam exterior roof panel separated with thermal spacers

The interior liner shall be a flat or rib type panel that is attached directly to structural members with screw fasteners. This panel is available in various unpainted or painted finishes. RTS thermal spacers are fastened at the purlin location, spaced typically at 24" centers, or closer if the loads require it, along the length of the roof supports. Fiberglass batt insulation is next laid on top of the liner panel. RTS clip depth and insulation thickness shall be as required to obtain specified "R" value. RTS clips are available to suit depths of 4", 6", 8", 10" and 12".

The exterior roof panel shall be, either Dura-Rib®, MBCI PBR, MBCI Double-Lok® or SSR standing seam panels as specified above.

4.3.4 Ribbed Wall Panels will be as follows:

a. Dura-Rib® wall panel will have 1 1/8" deep major ribs which taper in width from 7/8" to 3 1/2" and are spaced 12" on center. Between each major rib are two minor stiffening ribs. The "leading edge" rib has a bearing leg. Each panel will provide 36" of lateral coverage. Panel finish will be either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available.

b. MBCI PBR wall panel will have 1 1/4" deep major ribs which taper in width from 1" to 3 1/8" and are spaced 12" on center. Between each major rib are two minor stiffening ribs. The "leading edge" rib has a bearing leg. Each panel will provide 36" of lateral coverage. Panel finish will be either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available.

c. A-36 Architectural wall panel will have 1" deep major ribs which reverse taper in width from 2 1/8" to 1" and are spaced 12" on center. Between each major rib, the panel is formed into a sculptured valley shape that has a 2 1/4" flat panel at the center. Each panel will provide 36" of lateral coverage. Panel finish will be either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available.

d. MBCI PBA Architectural wall panel will have 1 1/8" deep major ribs which reverse taper in width from 2 3/8" to 1" and are spaced 12" on center. Between each major rib, the panel is formed into a sculptured valley. Each panel will provide 36" of lateral coverage. Panel finish will be either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available

4.3.5 Concealed Fastener Wall Panels shall be as follows:

a. ShadowRib (Concealed Fastener Wall Panel) will be roll-formed with the face of the panel having an inset portion in the center third of the 16" width to provide a 5 1/4" wide, low face plane between two 5 1/4" wide, high face planes at edges, Panel is 3" deep at the high planes and 1 1/2" deep at the low plane. Side laps shall be of interlocking flange design to form a rigid, permanently tight joint that will not open up or pull apart. Panels shall be connected to supporting structural members with fasteners that are concealed from exterior view. Factory applied sealant shall be provided in the interlocking side joint to make the installation weathertight. Each panel shall provide 16" coverage. Entire face of panel shall be embossed to add texture. Panel finish will be either Galvalume Plus® or painted. Refer to color charts for Standard and Premium paint colors available.

4.3.6 Insulated Wall Panels will be as follows:

a. ESP Wall Panel is a 36" or 42" wide factory insulated sandwich wall panel system consisting of steel skins chemically bonded to a polyurethane foam core. 2", 2.5", 3", 4" & 5" thick panels are available, measured from the panel flat surfaces. The exterior skin is available in 26 gauge embossed material. The interior skin is 26 Gauge white embossed flat material with shallow planks. Each panel will provide 36" or 42" coverage. Refer to color charts for Standard and Premium paint colors available.

b. Robertson RTS Wall System is a field assembled sandwich panel wall consisting of a metal liner panel, unfaced batt insulation and a ribbed or architectural exterior wall panel separated with thermal spacers.

The interior liner shall be a flat or rib type panel that is attached directly to structural members with screw fasteners. This panel is available in various unpainted or painted finishes. RTS thermal spacers are fastened at the girt location, spaced typically at 24" centers, or closer if the loads require it, along the length of the wall supports. Fiberglass batt insulation is next laid on top of the liner panel. RTS clip depth and insulation thickness shall be as required to obtain specified "R" value. RTS clips are available to suit depths of 4", 6", 8", 10" and 12".

The exterior wall panel shall be, either Dura-Rib®, MBCI PBR, MBCI PBA or A-36 architectural wall panels, as specified above.

4.4 **Flashing, Trim & Closures**

4.4.1 Flashing and/or trim will be furnished at eaves, gables, corners, base, framed openings and wherever necessary to seal against the weather and provide a finished appearance. Color will be selected from **Robertson's** Standard or Premium paint colors.

Profiles and dimensions of all flashing/trim will be to **Robertson's** standards.

4.4.2 Eave gutters and downspouts may be specified as optional. Gutters are box-shaped with face profile shaped to match rake trim. Downspouts are rectangular-shaped (4" x 5" min. size) and will have a 45 degree elbow at the bottom. Color for gutters and downspouts will be selected from **Robertson's** Standard and Premium paint color charts.

4.4.3 Color coated Galvalume Plus® or galvanized steel for flashing, trim, metal closures, gutter and downspouts and other miscellaneous uses will be typically of the same specification as the roof and wall covering material.

4.4.4 Preformed, closed cell, polyethylene closure strips matching the profile of the panel will be installed along the eave and at other locations to provide a weathertight application when shown on **Robertson's** erection drawings.

4.5 **Fasteners**

4.5.1 Roof fasteners will be self-drilling carbon steel screws with an integral 5/16" hex. Washer head (washer face undercut to encapsulate a sealing washer). Screws for panel-to-structural application will be #14 diameter with a minimum length of 1 ¼". Stitch screws will be ¼" diameter and 7/8" long.

Standard roof fasteners will be screws with carbon steel heads and will have a sealing washer (PVC or EPDM). Entire fastener (body and head) will have 0.0005" minimum thickness zinc plating plus a polymer coating or long term corrosion resistance. When used with color coated material, fastener head will also be painted to match panel and/or trim color.

Optional roof fasteners will be screws with an "Extended Life" head and will have a sealing washer (EPDM). "Extended Life" heads will be either, a zinc/aluminum/ manganese alloy casting, or a 300 series stainless steel cap (customer's option). Body (shank) of fastener will have 0.0005" minimum thickness zinc plating. When used with color coated material, fastener head will be painted to match panel and/or trim color.

- 4.5.2 Wall fasteners will be self-drilling carbon steel screws with an integral 5/16" hex. washer head. Screws for panel-to-structural application will be #14 diameter with a minimum length of 1 1/4". Stitch screws will be 1/4" diameter and 7/8" long.

Both standard and optional wall fasteners will have carbon steel heads. Entire fastener (body and head) will have 0.0005" minimum thickness zinc plating plus a polymer coating for long term corrosion resistance. Fastener head will also be painted to match wall panel and/or trim color.

Optional wall fasteners will be screws with an "Extended Life" head and will have a sealing washer (EPDM). "Extended Life" heads will be either, zinc/aluminum/manganese alloy casting, or a 300 series stainless steel cap (customer's option). Body (shank) of fastener will have 0.0005" minimum thickness zinc plating. When used with color coated material, fastener head will be painted to match panel and/or trim color.

4.6 **Sealants**

- 4.6.1 Sealants for side laps, end laps, accessories, etc. will be a preformed, butyl rubber based compound. The material will be non-hardening, non-shrinking and non-corrosive and will have excellent adhesion to metals, painted surfaces and plastics at temperatures from -30°F to 160°F. These sealants will be in tape mastic form, of shape and size recommended by **Robertson** for various applications, and will have paper backing for easy handling.
- 4.6.2 Tube sealants will be used to supplement tape mastic sealants and will be applied in locations indicated by erection instructions. Tube sealant will be a synthetic, elastomer-based material which becomes tack-free in less than 2 hours at 75°F but retains flexibility.

4.7 **Installation of Wall and Roof Panels**

- 4.7.1 Wall panels will be continuous from base to eave. If panel lengths exceed manufacturing and shipping limitations, splice will occur over a wall girt.
- 4.7.2 Roof panels will be continuous from eave to ridge. If panel lengths exceed shipping and manufacturing limitations, splice end laps will be installed per **Robertson's** erection details. Sealant will be used in all roof panel end laps.
- 4.7.3 When specified, all ribbed roof panel side laps will be sealed with a field-applied, continuous ribbon of tape mastic sealant. Eaves will also be sealed when specified.

4.7.4 Fastener population and pattern for both wall and roof panels will be as shown on erection details.

5. ACCESSORIES

5.1 Walk Doors

5.1.1 The door panels are a flush 1-3/4" leaf with each face formed of 20 or 18 gauge steel. The panels are galvanized and include a polystyrene core. Lockset locations are in accordance with ANSI/DHI A115.1 (mortise) and A115.2 (bored). The lockset reinforcement is 14-gauge. Hinge mortises are reinforced with 10 gauge steel welded in place and tapped for 1 1/2 pairs of 4 1/2" x 4 1/2" templated hinges. All door panels have a 12-gauge closer reinforcement plate.

5.1.2 The frames are 5-3/4" galvanized 16 gauge steel. All stop heights are 5/8". All frame returns are 7/16". Hinge jambs are mortised and reinforced with 10-gauge steel welded in place and tapped for 1 1/2 pairs of 4-1/2" x 4-1/2" templated hinges. Hinge reinforcements are covered with a welded-in steel plaster guard. Strike jambs are mortised and reinforced to receive an ANSI/DHI A115.1 strike.

5.1.3 The subframe creates a framed opening for the unit and consists of two galvanized steel 16-gauge C-channels that match the girt depth for the building. They can be prepared to meet most any application (curbs, wainscote). For masonry applications, wire anchors are provided in lieu of the subframes, or in the case of finished openings, the door frames can be prepared with existing opening anchors.

5.1.4 The threshold is factory installed, 5-3/4" wide (matches frame depth) and is an extruded aluminum. It is saddle shaped not exceeding 1/2" in height which meets ADA requirements.

5.1.5 The hinges are factory installed and shall be 1-1/2 pair, 4-1/2" x 4-1/2", five knuckle, two ball bearings, with a non-rising removable pin. They are a templated standard weight with a US26D (Satin Chrome) finish.

5.1.6 The lockset is factory installed and is a commercial Grade 2 cylindrical lever with a US26D (Satin Chrome) finish having a 2 3/4" backset. The WEATHERSEAL is factory installed onto the two jambs and header. It is adjustable and is composed of an extruded aluminum with an extra large Santoprene Bulb. There are also corner fin pads in the bottom corners of the frame.

5.1.7 The door sweep is factory installed and is composed of an extruded aluminum with a heavy duty vinyl insert. It is also adjustable and incorporates a drip cap that weeps water away from the threshold.

5.2 Windows

5.2.1 Extruded aluminum shall be 6063-T5 alloy and temper.

5.2.2 Hardware: Horizontal slider shall have a painted zinc die cast sweep latch which mechanically retains the frame meeting rail. Spring loaded latches shall not be permitted.

Projected vents shall have a cam handle with a concealed pawl painted to match the window finish and a steel strike.

Projected windows shall have Bronze Craft Defender Series stainless steel operating arms. Aluminum or carbon steel arms shall not be permitted.

Horizontal slider roller system shall consist of an injection molded, nylon housing with brass tire on a stainless steel axle. Nylon or one piece brass roller/axle assemblies shall not be permitted.

- 5.2.3 Weatherstrip: Horizontal slider shall be weatherstripped with Amesbury WINDO-FIN GLIDEFIT medium density polypropylene pile with mylar fin or equal.

Projected vent weatherstripping shall be a co-extruded Santoprene Bulb with a polypropylene backer or equal.

- 5.2.4 Glass and Glazing: Glass shall be SSB (2 mm) or DSB (3 mm) clear, tinted, obscure and/or tempered as required.

Insulated glass shall have an "A" level rating with a five (5) year warranty against seal failure. Glass sealant shall be polysulfide. Glass unit overall thickness shall be not be less than 5/8". 1" is also available for fixed and projected lights.

- 5.2.5 Thermal Barrier: All aluminum exposed to the exterior shall be thermally separated from aluminum on the interior by either a poured-in-place polyurethane thermal barrier or a rigid PVC extrusion.

5.3 **Wall Louvers**

- 5.3.1 Wall louvers will be operable type, with pull-chain operator, weather-stripped blades, and removable insect screens. Mounting fins for connecting to structural sub-framing will be provided. Louvers are available in factory bronze only.

- 5.3.2 Single louver size will be 48" x 48". Double or multiple louver banks can be formed by joining side fins together, and adding a reinforcing mullion.

- 5.3.3 Louver will be made of galvanized steel. Frame will be 18 gauge (min.) and blades will be 20 gauge (min.) material. Frame joints will be welded. Blades will be overlapping type, providing maximum weather tightness when closed and allowing free air flow when open.

- 5.3.4 Screens will be 18/16 aluminum or fiber mesh in an extruded or formed aluminum frame. Screens will be exterior mounted. .

- 5.3.5 Structural sub-framing, consisting of angle sections (hot-rolled or cold formed), will be furnished with each louver. Sub-framing, consisting of cold formed channel sections in lieu of angles, may be specified as optional.

- 5.3.6 Sheet metal trim will be furnished to flash around louver and provide a finished appearance.

5.4 Framed Openings

- 5.4.1 Framed openings will be furnished by **Robertson** to accommodate Overhead Doors or Roll-up Doors supplied by others. Framed openings will consist of structural framing to provide a large opening in a wall, along with necessary trim to flash around this opening and provide a finished appearance.
- 5.4.2 Size of opening will be determined by size of door specified. Structural framing (jambs and header) will consist of cold-formed, open Cee-sections (8 1/2 " or 10 " deep) or hot-rolled channel sections, depending on structural requirements. Necessary clips and fasteners, for making connections for all members, will be provided. Trim around opening will be **Robertson's** standard to accommodate wall panel configuration. (Door track supports by door supplier).
- 5.4.3 Color trim to entirely cover structural jambs and header may be specified as an option.

5.5 Translucent Panels (Roof)

- 5.5.1 Roof Light Transmitting Panels (LTPs) will be General Purpose, type I, translucent panels manufactured from polyester resin reinforced with a mesh of woven fiberglass cloth in addition to chopped glass fibers. These panels are only available with the same configuration as Dura-Rib®, MBCI PBR, MBCI Double-Lok®, MBCI Ultra-Dek® and SSR profiles.
- 5.5.2 Panels will have a minimum weight of 8 ounces per square foot. Exterior face will be smooth or have a pebble texture, and color will be white.
- 5.5.3 Ribbed translucent panels will provide 36" net coverage. Installation of translucent roof panels is similar to that of steel ribbed panels.
- 5.5.4 Standing seam translucent panels are 24" wide. Typical opening in roof is 1'-6" wide. **Standing seam LTPs are installed in a field cut hole in the panel after the standing seam panel has been seamed.**
- 5.5.5 Insulated roof translucent panels are also available for the Standing seam roof panel configurations. Insulated roof lights consist of an exterior panel as specified above, plus a clear, lightweight, translucent interior panel. These two panels are separated by a thin layer of foam insulation. Insulated roof panel (lights) have a thermal resistance factor (R) of 1.89.

5.6 Translucent Panels (Wall)

- 5.6.1 Wall Light Transmitting Panels (LTPs) will be General Purpose, type I, translucent panels manufactured from polyester resin reinforced with chopped glass fibers. These panels are only available in the same configuration as the Dura-Rib®, MBCI PBR and MBCI PBA profiles.
- 5.6.2 Panels will have a minimum weight of 8 ounces per square foot. Exterior face will have a pebble texture, and color will be white.
- 5.6.3 Each panel will provide 36" net coverage. Installation of translucent wall panels is similar to that of steel panels.

5.6.4 Insulated wall panels (lights) are not available.

5.7 Roof Ventilators (Ridge)

5.7.1 Univents or ridge ventilators will be gravity type with operable dampers furnished with bird screens. Ventilator will have skirts suitable for mounting directly on ribbed panels and end caps that are adaptable, with slight field modification, for use on buildings with roof slopes between 1/4 in 12 and 4 in 12. **Not available on single slope buildings.**

5.7.2 Single units will be 10'-0" long and will have a 9" throat opening. Each ventilator will have end caps at both ends which allow the vent to be used, without modification, as a single unit or in continuous run.

5.7.3 Ventilator will be made of 26 gauge G-90 galvanized or Galvalume Plus® steel substrate with Shell White finish. Bird screens will be 1/2" mesh, 19 gauge galvanized hardware cloth. Ventilators will be shop assembled, and all connections will be riveted and sealed to prevent leaking.

5.7.4 Dampers will be controlled from the floor by chains connected to the ventilator pull bar. Dampers are spring loaded to remain in the open position and are closed by pulling and locking the chain. Dampers have a positive wind-lock in any position to prevent damper flutter.

5.7.5 Operator kits are available to provide remote operation of dampers from almost any convenient location along the end wall or side wall. Hook-up kits are also available which allow dampers of up to 6 continuous vents to be tied together to operate as a single operator.

5.8 Roof Ventilators (Round)

5.8.1 Monovents or round roof ventilators will be gravity type with operable dampers, and will be furnished with bird screens. Ventilator will have a built-in base with a skirt suitable for mounting directly on ribbed panels. Roof slope must be specified so that base may be fabricated to match.

5.8.2 Round ventilators will have a 20" diameter throat opening.

5.8.3 Ventilator will be made of 26 gauge G-90 galvanized or Galvalume Plus® substrate with Shell White finish. Bird screen will be 1/2" mesh and all connections will be riveted and sealed to prevent leaking.

5.8.4 Dampers will be controlled from the floor by chains connected to the ventilator pull bar. Dampers are spring loaded to remain in the open position and are closed by pulling and locking the chain.

5.8.5 When used on gabled buildings with ribbed roof panels, the vent will straddle the ridge, while on single slope buildings, the vent will be mounted slightly down slope from the high side wall.

5.9 Pipe Flashing

5.9.1 Pipe flashing units will be a one piece construction that accommodates pipes made of steel, cast iron, P.V.C. and sheet metal. Pipe flashing units are molded rubber cones with an aluminum ring bonded to the base. The pipe flash is field cut to fit around the penetration and the base shaped to fit the contour of the roof panel, then attached with fasteners and sealant.

5.9.2 Unit may be specified in one of three sizes, as follows:

#3 size for 1/4" to 4" outside pipe diameter

#5 size for 4" to 7" outside pipe diameter

#8 size for 7" to 13" outside pipe diameter

5.10 Insulation

5.10.1 Metal building insulation is not supplied by **Robertson**, unless specified.

6. BUILDING FOUNDATION

6.1.1 Anchor rods will be furnished by others (not **Robertson**) and will be set in strict accordance with **Robertson's** anchor rod drawings. Anchor rods will be sized based on shear and tension. Anchor rod lengths to be determined by the Foundation Engineer. All anchor rods will be unpainted so as to bond with the concrete in which they are set.

6.2.1 The building foundation will be designed by a qualified engineer to support the metal building and all other loads required by the occupant's usage. **Robertson** will supply column reactions to be used for designing the building foundation and also the anchor rod embedments.

7. INSTALLATION

7.1.1 The erection of **Robertson Building Systems** will be in accordance with applicable erection drawings, and other erection information furnished by **Robertson**.

7.1.2 Erection will be performed by a qualified erector using proper tools and equipment. It will be the responsibility of the erector to comply with all applicable legislative and safety requirements. It will further be the responsibility of the erector to determine and provide any and all temporary bracing, bridging, blocking, shoring, and/or securing of components, etc. as required for stability during the entire erection process.

7.1.3 Erector will not make any field modifications to any structural member except as authorized and specified by **Robertson**.

8. WARRANTIES

8.1 Material and Workmanship Warranties

8.1.1 **Robertson** will furnish a one (1) year limited warranty against failures, caused by faulty or substandard material within limits set by the warranty, with every building designed and manufactured by **Robertson**,. This "Robertson Building Limited Warranty" will also certify the design criteria used for the structural design of the building.

8.1.2 The “Robertson Building Limited Warranty” also includes the standard roof and wall paint warranties. The type of panel and finish are to be written in on the warranty document and this establishes the applicable warranty period.

8.2 Paint Warranties

8.2.1 Twenty-Five (25) Year Warranty – **Robertson’s** Standard or Premium Paint:

All panels which are color coated with **Robertson’s** Standard or Premium Paint may be warranted, within limits set by the warranty, for a period of 25 years against chalk, fade, crack, check, blister or peel. This 25-year wall paint warranty is offered only if so requested on the contract documents as indicated in the “Robertson Building Limited Warranty.”

8.3 Other Warranties

8.3.1 Contact Robertson to check other available warranties. Note that some warranties will incur a cost.

These specifications are subject to change without notice.

For additional information on Robertson products, visit www.RobertsonBuildings.com