



# Architectural Manual



## Introduction

The purpose of the Corle Building Systems Architectural Manual is to provide an overview of how to design and specify a Corle Building. We pride ourselves on providing outstanding customer service and are here to help with any questions you may have.

This manual serves as a general guideline to design a custom-engineered metal building by Corle, but in no way defines the limitations of what you can create.

Also contained in this manual:

- Detailed instructions on how to specify and order a Corle Building
- General Specifications to assist with specifying a Corle Building
- General Corle Building details for most conditions

Please feel free to contact your Corle Building Systems District Manager when designing and specifying your next metal building.

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Imler, PA 16655  
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## **Customer Service Policies & Procedures**

Corle Building Systems recognizes the "Common Industry Practices" as compiled by the Metal Building Manufacturer's Association (MBMA), as its standard, specific guidelines of the design, manufacture, sale and erection of its components and building systems.

These guidelines can be found in your 2008 Metal Building Systems Manual and are intended to serve as a specific checklist of policies and procedures to be implemented by parties involved in preparing order or contract documents governing the sale and direction of the products of Corle Building Systems.

Wherever there is a conflict between the order or contact document and these practices, however, the contract will prevail.



## **Corle-Specific Information**

## Basic Building Layout

Page 3 of this section shows a drawing of the basic Corle Building layout. It shows a number of ways to configure a Corle Building and some visual depictions of the following basic definitions:

### Wall Names

**Sidewall** - The building sidewall is the Eave Wall

**Endwall** - The building endwall is the Gable Wall

**Steel Line** - The lines that define the overall dimensions of a Corle Building

**Frame Construction for Endwalls** - this is explained in detail later in this manual.

**Bay Spacing Conventions** - Shows how bays are referenced for all walls and the building overall.

### Building Order Form

Order using Corle's web-based QuickQuote™ program. Contact a Corle Building Systems District Sales Manager for complete details.

### Building Information

**Width** - the width is the distance from the outside to outside of sidewall secondary framing.

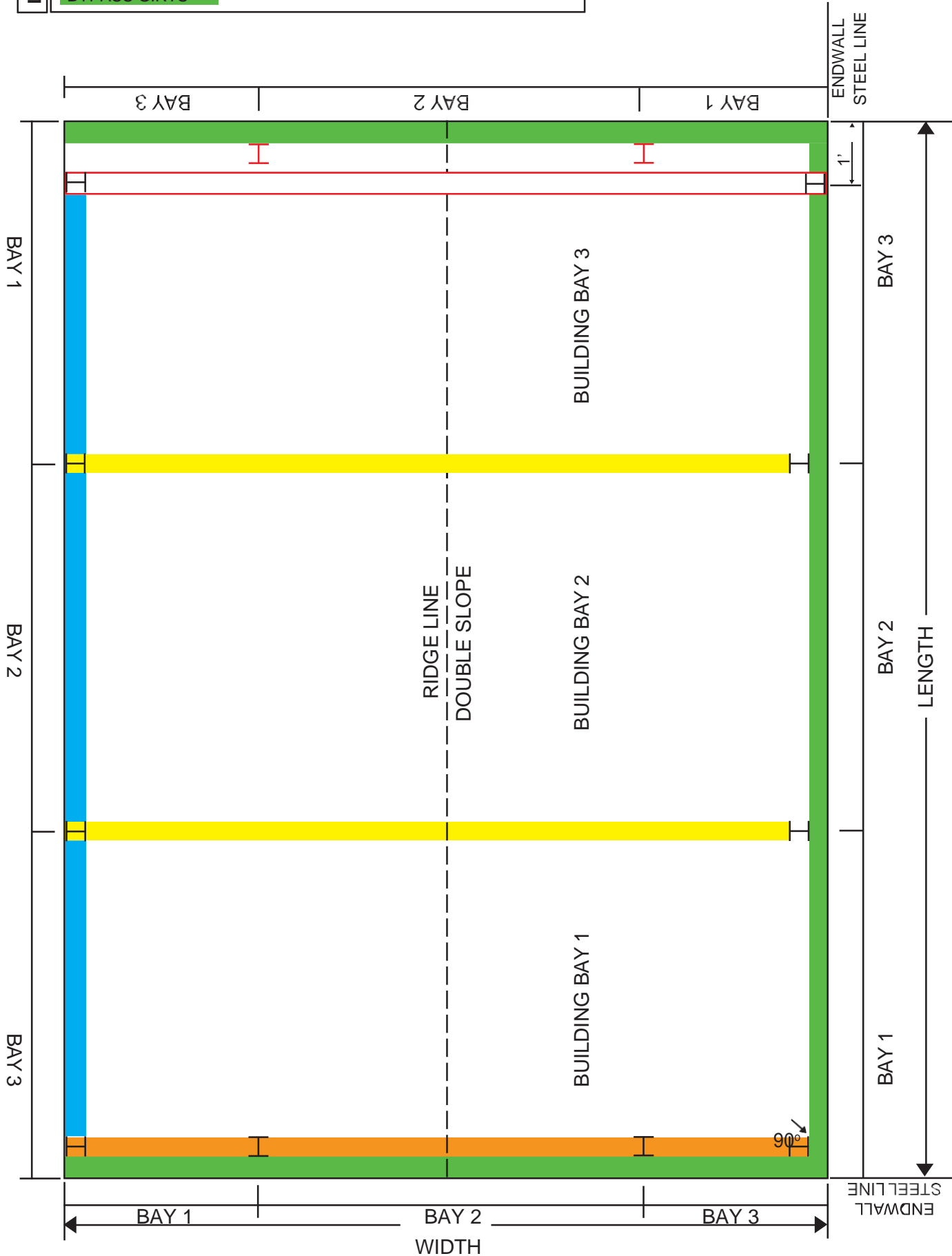
**Length** - the building length is the distance from outside to outside of endwall secondary framing (girt).

**Eave Height** - the distance from the finished floor to the top of the eave strut.

The eave strut is the secondary framing member at the intersection of the wall and the eave of the roof.



<b>LEGEND</b>	<span style="background-color: orange; border: 1px solid black; padding: 2px;">BEARING FRAME</span>	<span style="background-color: yellow; border: 1px solid black; padding: 2px;">INTERIOR FRAME</span>
	<span style="background-color: blue; border: 1px solid black; padding: 2px;">FLUSH GIRTS</span>	<span style="border: 1px solid red; padding: 2px;">EXPANDABLE / NONEXPANDABLE FRAME</span>
	<span style="background-color: green; border: 1px solid black; padding: 2px;">BYPASS GIRTS</span>	



**Bay Spacing** - The bay spacing is defined for two locations:

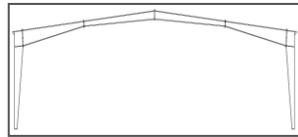
The first or last bay (end bays): The bay spacing is the distance from the outside of the wall secondary on the perpendicular wall to the centerline of the first frame. See the basic building layout for bay spacing.

An interior bay: The bay spacing is from frame centerline to frame centerline. See the basic building layout for bay spacing.

The “Building Bay Spacing” is always determined by the bay spacing for the front sidewall.

**Interior Frame Type** - The interior frames are the “main frames” of the building. They define the overall shape of the building -- Double Slope, Single Slope, Lean-To, etc.

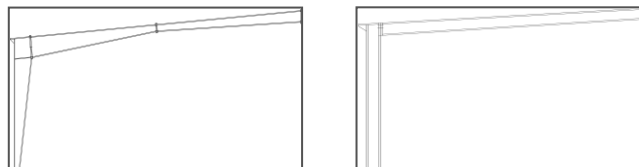
**RF - Rigid Frame Building** - This is a double slope building.



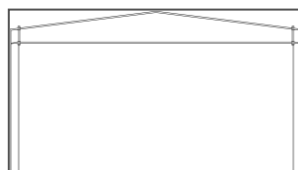
**SS - Single Slope Building** - The back-side wall is the low eave.



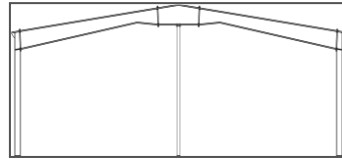
**LT - Lean-To** - A lean-to attaches to another building and has a frame “missing” a column.



**TB - Tapered Beam** - This is a double slope building, similar to an RF, except that the roof beam has a horizontal bottom chord.

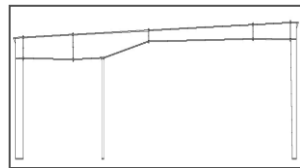


**RF-\_\_** - This is a double slope building with interior columns on the frame. This allows for a much wider building when interior columns can be used to make a more economical frame. The blank is filled with the number of interior columns (total columns, minus two).



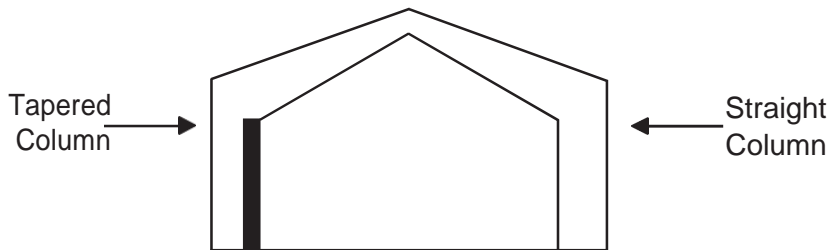
This is an RF-1 Frame

**SS-\_\_\_\_\_** - This is a single building with interior columns on the frame. This allows for a much wider building when interior columns can be used to make a more economical frame. The blank is filled with the number of interior columns (total columns, minus two).

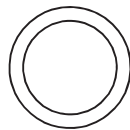


This is an SS-1 Frame

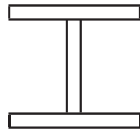
**Exterior Column Shape** - The sidewall columns can be tapered or straight. Taped Columns are more economical. Straight columns can have their depth specified, however, the shallower they are, the heavier and more costly they will be -- i.e. a 24" deep column on a large building will likely be more cost effective than a 12" deep column.



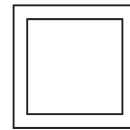
Interior Column Type



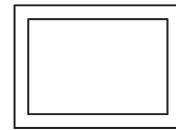
Pipe



Wide Flange



Square



Rectangle

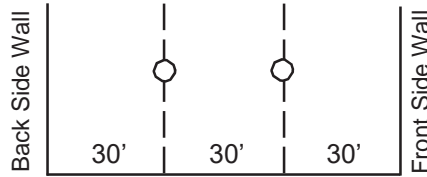
## Elevation

Interior columns can have their bases located Above (a.f.f.) or Below (b.f.f.) the finished floor elevation.





**Interior Column Location** - dimensioned as shown in this sketch.

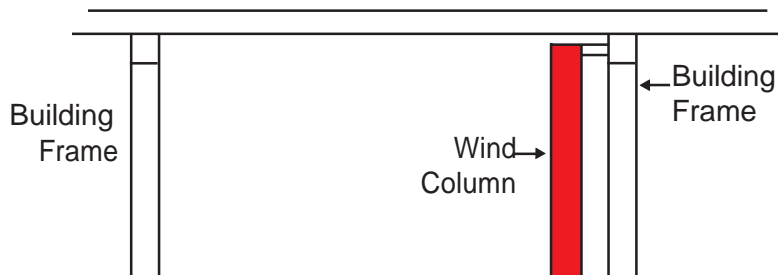


This represents a spacing or 30'-0", 30'-0"

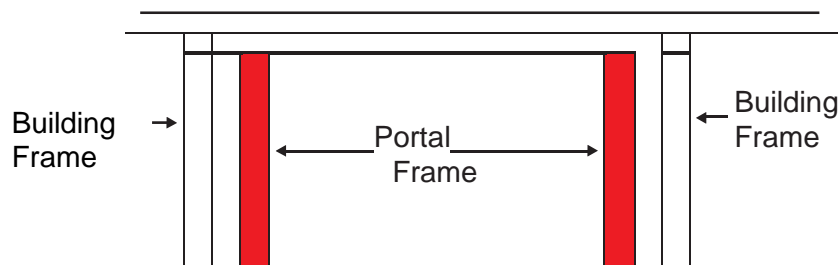
## Bracing

**Standard Bracing** - Standard bracing uses wall panel shear, if that is adequate. If not, cable bracing is used. Cable bracing may limit the openings available in that particular bay.

**Wind Column** - A wind column is a "flag pole"-like means of bracing a building.



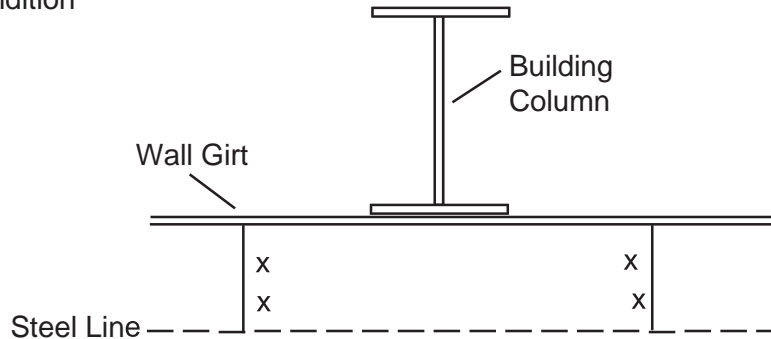
**Portal Frame** - A portal frame is a set of columns and a beam placed on top to provide bracing between two frames when an open bay is needed.



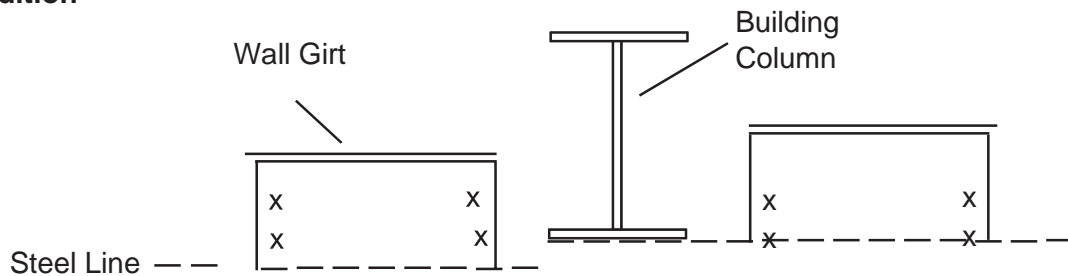
**Other** - Other types of bracing may include a masonry shear wall or another adjacent building.

## Girt Condition

Bypass Condition



## Flush Condition



**NOTE:** Girts are in the same position relative to the steel line; the column locations move.

Note: the girts are located in the same position, the column moves dependent on the condition (all relative to the "steel line").

Girt conditions can be used in any combination and with all frame types.

## Roof Extension

A roof extension is simply an overhang, either on a sidewall or an endwall. Standard roof extensions start at a column line and end at a column line.



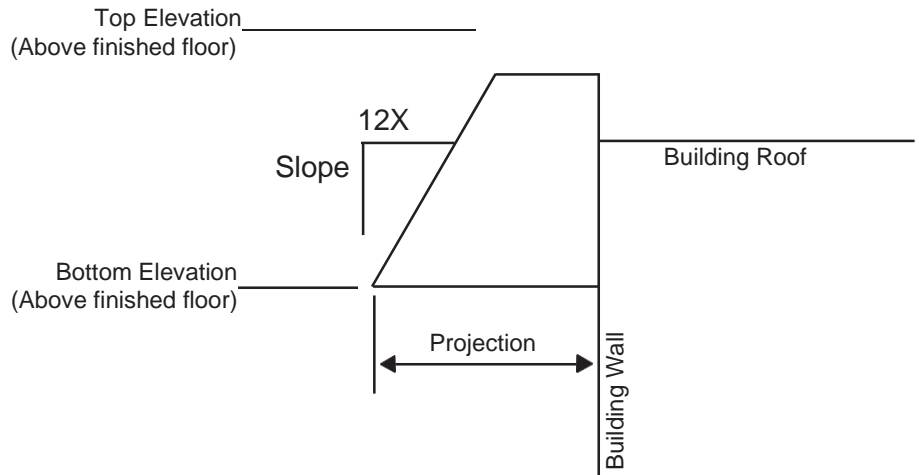
The roof extension starts in Bay 2 and ends in Bay 3.

Note: Bays are numbered left-to-right standing outside the building looking at it.

## Mansards / Facades / Parapets

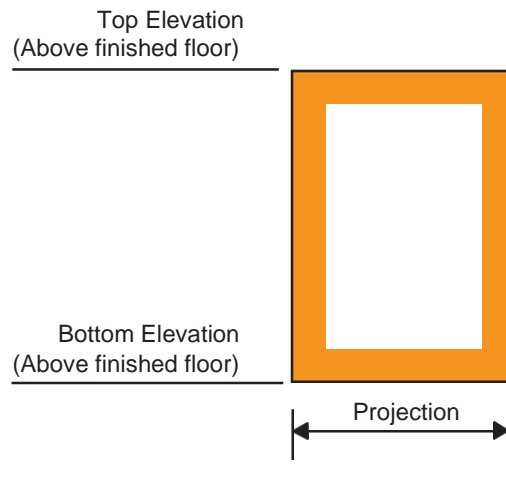
### Mansards

Start and End Bays are the same as for roof extension.



### Facades

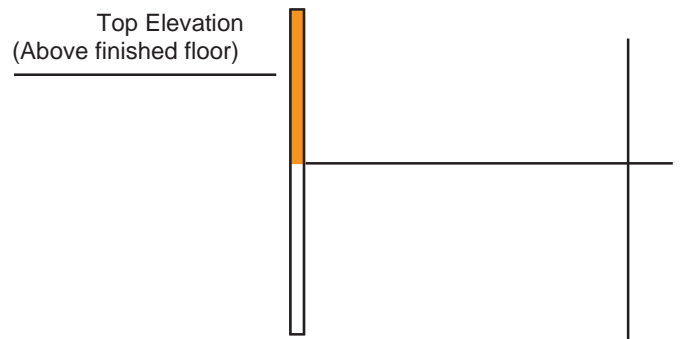
- Slope is not required for facades.
- Start and End Bays are the same as for roof extensions.



### Parapets

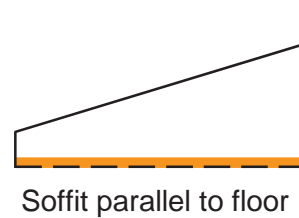
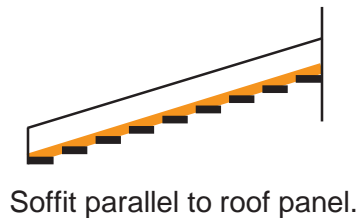
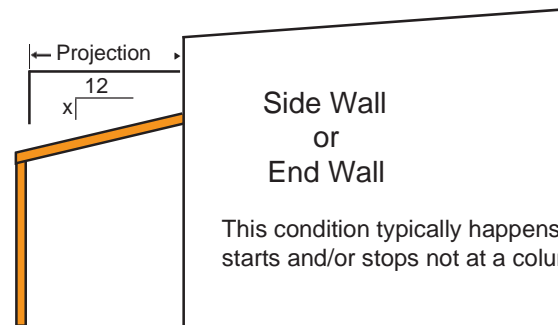
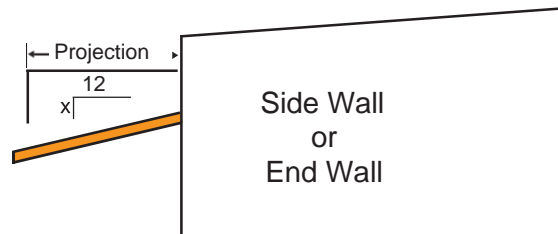
A parapet usually has a zero projection and only a top elevation.

- Slope is not required for parapets.
- Start and End Bays are the same as for roof extensions.



## Canopies

Canopies are projections that happen below the building roof plane.



## Gutter

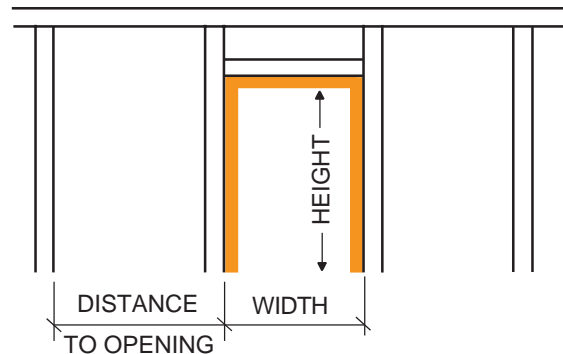
Snow gutter is recommended in locations where sliding snow and ice may occur. The front edge of the snow gutter is lower than the standard gutter to aid in the snow and ice that may slide off of a building.

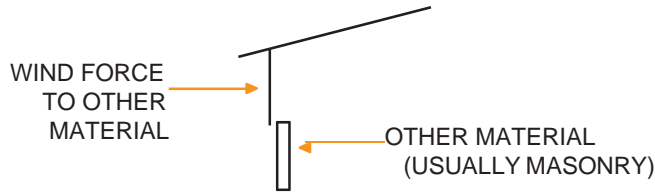
## Closures

Closures are used to fill the gap between secondary framing and the high cells of the roof and wall panels. Closures are not typically used if the wall condition is open.

## Wall Framed Openings

Field located framed openings will have all the wall panels to cover that bay and factory located framed openings will have panels cut at the factory.





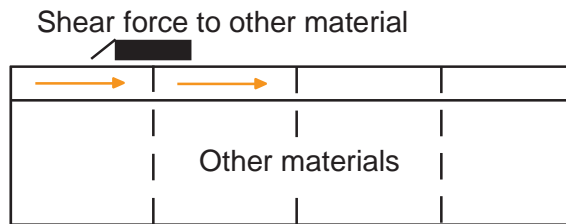
## Open Walls

Open walls indicate no panels are provided by Corle for those areas. The wall can be open for other materials, such as masonry, glass, tilt-up panels, etc. The wall also may be “open to remain open” for structures such as canopies of storage building with 3 walls covered with wall panels.

Bay Start and Bay End is the same as for Roof Extensions. Custom conditions can start or stop at any location and must be entered on modifications.

Deduct indication to remove panel only (girts will be provided to support other material or to remove panel and girts).

Top of wall to take panel shear -  
This asks if the other wall material can support the bracing reactions in the plane of the wall.



Top of the wall to Support Bottom or Wall Panel means the other material can support the panel reactions at the top of the other material perpendicular to the plane of the wall.

## Modifications

These instructions address Corle Building Systems standard building product layout. We can customize any portion to meet your design needs. Please feel free to contact your District Manager with any questions you may have.



# **General Specifications**



## General Specifications

### **Purpose**

The purpose of these specifications is to describe the design criteria, material quality, and fabrication processes used in metal building systems designed, manufactured and furnished by Corle Building Systems (herein referred to as “Corle Building Systems” or “Corle”). They are intended to ensure that Architects, Engineers, General Contractors, Erectors, and/or Owners understand the basis for design, manufacture, and application of these materials. They are also intended to function as a guide specification for use by the design professional, i.e., Architect and/or Engineer, in writing the technical specification portion of the Contract Documents for a project that incorporates a pre-engineered metal building system.

Please note that the materials, products, finishes, etc. described in these specifications represent the Corle Building Systems standard. Other options are available upon request/special order. Please contact our office to discuss any item or items in these specifications that does not appear to comply with the metal building system specification for the project on which you are bidding.

### **Format**

To better facilitate the use of these specifications, we have organized them in the Construction Specifications Institute (CSI) Master Format, utilizing the three-part specification that is most common in the construction industry. Toward that end, this document has been titled “Section 13125 – Metal Building Systems.”

Corle bases its specifications on the standards established by the professional organizations/societies recognized by the pre-engineered metal buildings industry. These include, but may not be necessarily limited to, MBMA, AISC, AISI, AWS, and ASTM.

### **Revisions**

Due to Corle's policy of continuous product development and improvement, and also due to possible changes in material availability, these specifications are subject to revision without notice.



### SECTION 13125 - METAL BUILDING SYSTEMS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

A. This Section includes the following:

1. Structural framing.
2. Roof panels.
3. Wall panels and liners.
4. Insulation.
5. Building components, as follows:
  - a. Personnel doors, frames, and hardware.
  - b. Aluminum windows.
  - c. Louvers and ventilators.
6. Accessories and trim.

B. Related Sections may include the following:

1. Division 3 Section "Cast-in-Place Concrete" for concrete foundations and anchor-bolt installation.
2. Division 4 Section "Unit Masonry" for brick masonry exterior walls and load-bearing masonry walls.
3. Division 7 Section "Building Insulation" for roof and wall insulation not standard with Corle.
4. Division 7 Section "Manufactured Roof Panels" for roof panels not standard with Corle.
5. Division 7 Section "Manufactured Wall Panels" for wall panels not standard with Corle.
6. Division 7 Section "Roof Accessories" for accessories not standard with Corle.
7. Division 8 Section "Overhead Coiling Doors" for overhead coiling doors not standard with Corle.
8. Division 8 Section "Sectional Overhead Doors."
9. Division 8 Section "Metal-Framed Skylights" for skylights.
10. Division 9 Section "Painting" for shop-applied finishes not standard with Corle.

##### 1.2 DEFINITIONS

- A. Bay Spacing: Dimension between main frames measured normal to frame (at centerline of frame) for interior bays, and dimension from centerline of first interior main frame measured perpendicular to end wall (outside face of end-wall girt).
- B. Building Length: Dimension of the building measured perpendicular to main framing from end wall to end wall (outside face of girt to outside face of girt).
- C. Building Width: Dimension of the building measured parallel to main framing from sidewall to sidewall (outside face of girt to outside face of girt).
- D. Clear Span: Distance between supports of beams, girders, or trusses (measured from lowest level of connecting area of a column and a rafter frame, or knee).
- E. Eave Height: Vertical dimension from finished floor to eave (the line along the sidewall formed by intersection of the planes of the outside faces of purlins and girts).
- F. Clear Height under Structure: Vertical dimension from finished floor to lowest point of any part of primary or secondary structure, not including crane supports, located within clear span.
- G. Terminology Standard: Refer to MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.





**1.3 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide a complete, integrated set of Corle’s standard mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Include primary and secondary framing, roof and wall panels, and accessories complying with requirements indicated, including those in this Article.
  - 1. Structural Steel Design Standard: All structural steel sections and built-up welded-plate members shall be designed in accordance with the applicable sections relating to the allowable stress design requirements of the latest edition of the American Institute of Steel Construction (AISC), *Specification for Structural Steel Buildings - Allowable Stress Design*.
  - 2. Cold-Formed Steel Design Standard: All light-gauge, cold-formed structural members and panels shall be designed in accordance with the applicable sections relating to the allowable stress design requirements of the latest edition of the American Iron and Steel Institute (AISI), *North American Specification for the Design of Cold-Formed Steel Structural Members*.
- B. Metal Building System Design: Of size, spacing, slope, and spans indicated, and as follows:
  - 1. Primary Frame Type: Provide the following:
    - a. Rigid Clear Span: Solid-member structural-framing system without interior columns.
    - b. Rigid Modular: Solid-member structural-framing system with interior columns.
    - c. Lean to: Solid- or truss-member structural-framing system without interior columns, designed to be partially supported by another structure.
  - 2. End-Wall Framing: Corle’s standard, for buildings not required to be expandable, as follows:
    - a. Provide primary frame, capable of supporting one-half of a bay design load, and end-wall columns.
    - b. Provide load-bearing end-wall and corner columns, and rafters.
  - 3. End-Wall Framing: Engineer end walls to be expandable. Provide primary frame, capable of supporting full-bay design loads, and end-wall columns.
  - 4. Secondary Frame Type: Corle’s standard purlins and girts in one or more of the following mounting conditions:
    - a. Flush-framed.
    - b. Partially inset.
    - c. Exterior-framed (bypass).
    - d. Outset.
  - 5. Eave Height: \_\_\_\_\_.
  - 6. Bay Spacing: \_\_\_\_\_.
  - 7. Roof Slope: \_\_\_\_\_:12.
- C. Structural Performance: Corle shall provide metal building systems capable of withstanding the effects of the selfweight of the building system and the following loads and stresses within limits and under conditions indicated:
  - 1. Engineer metal building systems according to procedures in MBMA's "Metal Building Systems Manual."
  - 2. Design Loads: As indicated on the Contract Documents or as specified below:
  - 3. Design Loads: Comply with load requirements of MBMA's "Metal Building Systems Manual."
  - 4. Design Loads: As specified below:
    - a. Floor Live Load: \_\_\_\_\_psf.
    - b. Roof Live Load: \_\_\_\_\_psf.
    - c. Roof Snow Loads: \_\_\_\_\_psf.

- d. Wind Loads: \_\_\_\_\_ mph basic wind speed, based on [% fastest mile, % 3-second gust]
  - e. Collateral Loads: \_\_\_\_\_ psf for dead loads, other than the weight of metal building system, from permanent items such as sprinklers, mechanical systems, electrical systems, and ceilings.
  - f. Auxiliary Loads: From dynamic live loads, such as those generated by cranes and materials-handling equipment, as shown on the contract documents.
5. Load Combinations: The metal building systems shall be designed to withstand the most critical effects of load factors and load combinations as required by the building code in effect for this Project.
  6. Deflection Limits: Assemblies shall be engineered to withstand design loads with deflections no greater than the following:
    - a. Purlins and Rafters: Vertical deflection of [% 1/180, % 1/240] of the span.
    - b. Girts: Horizontal deflection of [% 1/180, % 1/240] of the span.
    - c. Roof Panels: Vertical deflection of [% 1/180, % 1/240] of the span.
    - d. Wall Panels: Horizontal deflection of [% 1/180, % 1/240] of the span.
  7. Secondary framing system shall be designed to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.
- D. Seismic Performance: Design and engineer metal building systems capable of withstanding the effects of earthquake motions determined according to the building code in effect for this Project.
- E. Thermal Movements: Provide metal building roof and wall panel systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): [% 120 deg F, % \_\_\_\_\_ deg F], ambient; [% 180 deg F % \_\_\_\_\_ deg F] (100 deg C), material surfaces.
- F. Wind-Uplift Resistance: Provide roof panel assemblies that meet requirements of UL 580 for wind-uplift resistance Class 90.

### 1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following metal building system components:
1. Structural-framing system.
  2. Roof and fascia panels.
  3. Wall panels.
  4. Liner and soffit panels.
  5. Translucent panels.
  6. Insulation.
  7. Vapor retarders.
  8. Trim and closures.
  9. Doors.
  10. Windows.
  11. Louvers.
  12. Accessories.
- B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other Work.
1. For installed components indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

2. Anchor-Bolt Plans: Include location and diameter of anchor bolts required to attach metal building to foundation. Indicate column reactions at each location.
  3. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
  4. Roof and Wall Panel Layout Drawings: Show layouts of panels on support framing, details of edge conditions, joints, panel profiles, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of the following products with factory-applied color finishes:
1. Roof and fascia panels.
  2. Wall panels.
  3. Liner and soffit panels.
  4. Trim and closures.
  5. Doors.
  6. Windows.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected, in the profile and style indicated. Prepare Samples from the same material to be used for the Work.
1. Roof Panels: 12 inches long by actual panel width. Include clips, caps, fasteners, closures, and other exposed panel accessories.
  2. Wall Panels: 12 inches long by actual panel width. Include clips, caps, fasteners, closures, and other exposed panel accessories.
  3. Translucent Panels: 12 inches long by actual panel width.
  4. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
  5. Vapor Retarders: 6-inch-square samples.
  6. Windows: Full-size, 12-inch-long frame samples showing typical profile.
- E. Design Certificate: Signed and sealed by a qualified professional engineer. Include the following:
1. Name and location of Project.
  2. Order number.
  3. Name of manufacturer.
  4. Name of Contractor.
  5. Building dimensions, including width, length, height, and roof slope.
  6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
  7. Governing building code and year of edition.
  8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic criteria (seismic zone or effective peak velocity-related acceleration/peak acceleration coefficients), and auxiliary loads (cranes).
  9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
  10. Building-Use Category: Indicate category of building use and its effect on load importance factors.
- F. Welding Certificates: Copies of certificates for welding procedures and personnel.
- G. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Material Test Reports: From a qualified testing agency indicating and interpreting test results of steel for compliance with requirements indicated.

- I. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
  - 1. Thermal insulation.
  - 2. Vapor retarders.
- J. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, indicating the following current products comply with requirements:
  - 1. Insulation and Vapor Retarders: Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.
- K. Surveys: Show final elevations and locations of major members. Engage a qualified engineer or land surveyor to perform surveys and certify their accuracy. Indicate discrepancies between actual installation and the Contract Documents.

### 1.5 QUALITY ASSURANCE

- A. Erector Qualifications: An experienced erector who has specialized in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of metal building systems that are similar to those indicated for this Project in material, design, and extent.
- C. Surveyor Qualifications: A land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing surveying services of the kind indicated.
- D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- E. Source Limitations: Obtain each type of metal building system component through one source from a single manufacturer.
- F. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code—Steel."
- G. Regulatory Requirements: Fabricate and label structural framing to comply with special inspection requirements at point of fabrication for welding and other connections required by authorities having jurisdiction.
- H. Structural Steel: Comply with AISC *Specification for Structural Steel Buildings*, March 9, 2005, for design requirements and allowable stresses.
- I. Cold-Formed Steel: Comply with AISI *North American Specification for the Design of Cold-Formed Steel Structural Members*, 2007 Edition, for design requirements and allowable stresses.

### 1.6 STORAGE AND HANDLING

- A. Handling: Unload, store, and erect roof and wall panels to prevent bending, warping, twisting, and surface damage.
- B. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weather-tight and ventilated covering. Store roof and wall panels to ensure dryness. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

### 1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when weather conditions permit roof and wall panel installation to be performed according to manufacturer's written instructions and warranty requirements.



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### 1.8 COORDINATION

- A. Coordinate size and location of concrete foundations and casting of anchor-bolt inserts into foundation walls and footings. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations, which are specified in Division 7 Section "Roof Accessories."

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Subject to compliance with requirements, provide products by Corle Building Systems, 404 Sarah Furnace Road, Imler, PA 16655.

### 2.2 STRUCTURAL-FRAMING MATERIALS

- A. Steel Bar: ASTM A 572 or ASTM A 529, Grade 55, 55,000-psi minimum yield strength.
- B. Structural-Steel Sheet, 0.149-inch thickness: ASTM A 1011, Grade 55, 55,000-psi minimum yield strength.
- C. Steel Plate,  $\frac{3}{16}$ -inch to  $\frac{3}{8}$ -inch thickness: ASTM A 572, Grade 55, 55,000-psi minimum yield strength.
- D. Structural-Steel Wide Flange Sections: ASTM A 572 or ASTM A 992, Grade 50, 50,000-psi minimum yield strength.
- E. Structural-Steel Channel and Angle Sections: ASTM A 36, 36,000-psi minimum yield strength.
- F. Hollow Steel Sections: ASTM A 500, Grade B.
  - 1. Round Sections – 42,000-psi minimum yield strength
  - 2. Square and Rectangular Sections – 46,000-psi minimum yield strength
- G. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, structural quality, Grade 55, with G60 coating designation; mill phosphatized.
- H. Steel Joists: Complying with SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders," manufactured with steel-angle top and bottom chord members, to produce joist types, end arrangements, and top chord arrangements indicated and required for secondary framing.
- I. Non-High-Strength Bolts and Eye-Bolts: ASTM A 307, Grade A, carbon-steel hex-head bolts, and eye-bolts; ASTM A 563 Grade A hex carbon-steel nuts and washers.
  - 1. Finish: Mechanically deposited or electroplated zinc coating.
- J. High-Strength Bolts: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 194 heavy hex Grade 2H or ASTM A 563 Grade C or DH carbon-steel nuts.
  - 1. Finish: Mechanically deposited or electroplated zinc coating.
- K. Nuts for High-Strength Bolts: ASTM A 194 heavy hex Grade 2H or ASTM A 563 Grade C or DH carbon-steel nuts.
  - 1. Finish: Mechanically deposited or electroplated zinc coating.
- L. Nuts for Non-High-Strength Bolts: ASTM A 563 Grade A hex carbon-steel nuts.
  - 1. Finish: Mechanically deposited or electroplated zinc coating.
- M. Bracing Cable: ASTM A 475, extra-high-strength grade, Class A zinc-coated, seven-strand steel.
- N. Primers: As selected by manufacturer for resistance to normal atmospheric corrosion, compatibility with finish paint systems, capability to provide a sound foundation for field-applied topcoats despite prolonged exposure, and as follows:
  - 1. Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer; complying with performance requirements of FS TT-P-636D, FS TT-P-664C and FS TT-P-664D.

### 2.3 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M and the following requirements:

1. Through-Fastened Panel other than Florida Approved:
    - a. Galvalume® Plus Finish: Aluminum-Zinc Alloy-Coated Steel Sheet; ASTM A 792, Class AZ55 coating, Grade 80; structural quality.
    - b. TRINAR® Finish: Aluminum-Zinc Alloy-Coated Steel Sheet; ASTM A 792, Class AZ50 or AZ55 coating, Grade 80; structural quality.
  2. Standing Seam Panel, Florida Approved Through-Fastened Panel:
    - a. Galvalume® Plus Finish: Aluminum-Zinc Alloy-Coated Steel Sheet; ASTM A 792, Class AZ55 coating, Grade 50, Class 4; structural quality.
    - b. TRINAR® Finish: Aluminum-Zinc Alloy-Coated Steel Sheet; ASTM A 792, Class AZ50 or AZ55 coating, Grade 50, Class 4; structural quality.
  3. Surface: Smooth, flat, mill finish.
- B. Panel Sealants
1. Sealant Tape: SikaLastomer 95 isobutyl tripolymer sealant tape, manufactured by Sika Corporation conforming to the following:
    - a. Color: gray.
    - b. Specific Gravity (ASTM D 792): 1.43.
    - c. Percent Solids (ASTM C 771): 100 percent solids.
    - d. Service Temperature Range (-60°F to 212°F): Passes.
    - e. Application Temperature Range (0°F to 120°F on oily Galvalume®): Passes -5°F to 120°F on oily Galvalume® and Trinar®.
    - f. Penetration (ASTM D 217): 9.8 mm.
    - g. Vehicle Bleed-out (21 days at 158°F): No bleed-out.
    - h. Flexibility (ASTM C 765): No cracking or loss of adhesion.
    - i. Elongation (ASTM C 908): 1100 percent.
    - j. Adhesive Tensile Strength (ASTM C 907): 24.5 psi.
    - k. Adhesion in Peel (ASTM D 3330): 16 pli.
    - l. Paint ability: Paintable.
    - m. Water Resistance (120°F submerged): Passes.
    - n. Weatherability (1,000 hours): Passes.
    - o. Compressibility (5 psi max at 77°F): 4.2 psi.
    - p. Static Water Head Test (MBMA) Ice Damming: 8 inches, passes.
    - q. Chemical Resistance: Resistant to water and water vapor. Affected by organic solvents.
    - r. Cold Flow (vertical roll hung on a nail 0.05 inches maximum after 48 hours): Passes.
    - s. Adhesion to Galvalume® at 5°F: Tape does not pull away from substrate when release paper is removed.
    - t. Angus Dry Film Mildewcide Test: No growth.
    - u. USDA and FDA-approved.
    - v. Available Profiles
      - 1) 1 inch wide by 1/8-inch-thick, double bead.
      - 2) 2½ inches wide by 3/16 inches thick, triple bead.
  2. Joint Sealant: SikaLastomer-511 non-skinning butyl sealant conforming to the following:
    - a. Density (ASTM D 1475): 10.3 ± 0.05 lbs./gal.
    - b. Total Solids (ASTM C 681): 85 percent, minimum.
    - c. Volume Shrinkage (ASTM D 2453): 16 percent, minimum.
    - d. String Length: Approximately 12 inches.
    - e. Extrudability (ASTM D 2452, Modified; 50 psi): 1.0 to 3.0 s/ml.
    - f. Slump (ASTM D 2202, Modified): ≤ 1/32 inches at 122°F, ≤ 3/32 inches at 158°F.
    - g. Service Temperature Range: -60°F to 220°F.

- h. Panel Installation Temperature: -10°F to 150°F.
- i. Non-Skinning/Drying: Soft, tacky, and engageable for up to 6 months.
- j. Vehicle Migration (AAMA 800-92, section 1.5.4.2, ASTM D 2203): < 1.5mm inch stain from the edge.
- k. Flexibility (ASTM C 711, Modified): No cracking and/or loss of adhesion at -60°F.
- l. Low Temperature Flexibility (AAMA 800-92, section 1.5.4.3, ASTM C 734): No cracking and/or loss of adhesion.
- m. Adhesion Strength (ASTM C 794-80):  $>0.40 \pm 0.05$  pli, bond loss is zero (0) to Galvalume®, Trinar®, and galvanized steel.
- n. Paint ability: Paintable.
- o. Water Resistance (120°F submerged): Passes.
- p. Staining (ASTM D 925 Method A, Modified): No deterioration of surface to Galvalume®, galvanized, or Trinar® 500.
- q. Heat Aging (ASTM C 792-75, C-661-91, D 2240-92): 14 percent average weight loss; zero cracking; zero chalking; 56 average Shore Durometer.

### 2.4 INSULATION MATERIALS

- A. Corle Metal Building Insulation: Corle shall provide one of the following products:
- B. Corle NAIMA 202-96 Insulation (manufactured as Microlite “L” by Johns Mansville International, Inc.): Glass-fiber-blanket thermal insulation, complying with ASTM C 991, Type I (Type II when faced); ASTM E 136; and NAIMA Standard 202-96.
  - 1. Standard Available Thicknesses: 3-inch, R-10; 4-inch, R-13, and 6-inch, R-19.
  - 2. Surface-Burning Characteristics (ASTM E 84): Flame spread, 0 to 25; smoke developed, 0 to 50.
- C. Vapor-Retarder Facing: Complying with ASTM C 1136 and having the characteristics listed for each type.
  - 1. Gym Guard (manufactured by Lamtec Corporation)
    - a. Composition: Metalized polypropylene-faced fiberglass/polyester blend fabric.
    - b. Permeance (ASTM E 96 Procedure A, Desiccant Method): 0.02 perm.
    - c. Bursting Strength (ASTM D 774): 250 psi.
    - d. Puncture Resistance (ASTM C 1136): 650 beach units.
    - e. Tensile Strength (ASTM C 1136): 195 pounds per inch-width (MD), 150 pounds per inch-width (XD).
    - f. Thickness (Micrometer): 0.007 inches.
    - g. Accelerated Aging (30 days at 95% relative humidity, 120°F): No Corrosion or delamination.
    - h. Low Temperature Resistance (ASTM D 1790): Remains flexible, no delamination.
    - i. High Temperature Resistance (4 hours at 240°F): Remains flexible, no delamination.
    - j. Water Immersion (24 hours at 73°F): No delamination.
    - k. Mold Resistance (ASTM C 665): No growth.
    - l. Dimensional Stability (ASTM D 1204): 25%
    - m. Light Reflectance (ASTM C 523): 85%.
    - n. Fire Testing per UL 723
      - 1) Flame Spread: Film exposed, 0; fabric exposed, 5.
      - 2) Smoke Developed: Film exposed, 30; fabric exposed, 40.
  - 2. PSK-VR (manufactured as WMP-VR by Lamtec Corporation)
    - a. Composition: Metalized polypropylene-faced, tri-directional fiberglass/polyester scrim-reinforced kraft paper.
    - b. Permeance (ASTM E 96 Procedure A, Desiccant Method): 0.09 perm.
    - c. Bursting Strength (ASTM D 774): 60 psi.

- d. Puncture Resistance (ASTM C 1136): 125 beach units.
  - e. Tensile Strength (ASTM C 1136): 40 pounds per inch-width (MD), 30 pounds per inch-width (XD).
  - f. Thickness (Micrometer): 0.008 inches.
  - g. Accelerated Aging (30 days at 95% relative humidity, 120°F): No Corrosion or delamination.
  - h. Low Temperature Resistance (ASTM D 1790): Remains flexible, no delamination.
  - i. High Temperature Resistance (4 hours at 240°F): Remains flexible, no delamination.
  - j. Water Immersion (24 hours at 73°F): No delamination.
  - k. Mold Resistance (ASTM C 665): No growth.
  - l. Dimensional Stability (ASTM D 1204): 25%
  - m. Light Reflectance (ASTM C 523): 85%.
  - n. Fire Testing per UL 723
    - 1) Flame Spread: Film exposed, 10; kraft exposed, 15.
    - 2) Smoke Developed: Film exposed, 10; kraft exposed, 5.
3. PSK-10 (manufactured as WMP-10 by Lamtec Corporation)
- a. Composition: Metalized polypropylene-faced, tri-directional fiberglass/polyester scrim-reinforced kraft paper.
  - b. Permeance (ASTM E 96 Procedure A, Desiccant Method): 0.02 perm.
  - c. Bursting Strength (ASTM D 774): 100 psi.
  - d. Puncture Resistance (ASTM C 1136): 125 beach units.
  - e. Tensile Strength (ASTM C 1136): 55 pounds per inch-width (MD), 50 pounds per inch-width (XD).
  - f. Thickness (Micrometer): 0.009 inches.
  - g. Accelerated Aging (30 days at 95% relative humidity, 120°F): No Corrosion or delamination.
  - h. Low Temperature Resistance (ASTM D 1790): Remains flexible, no delamination.
  - i. High Temperature Resistance (4 hours at 240°F): Remains flexible, no delamination.
  - j. Water Immersion (24 hours at 73°F): No delamination.
  - k. Mold Resistance (ASTM C 665): No growth.
  - l. Dimensional Stability (ASTM D 1204): 25%
  - m. Light Reflectance (ASTM C 523): 85%.
  - n. Fire Testing per UL 723
    - 1) Flame Spread: Film exposed, 10; kraft exposed, 15.
    - 2) Smoke Developed: Film exposed, 10; kraft exposed, 5.
4. WMP-50 (manufactured by Lamtec Corporation)
- a. Composition: Polypropylene-faced, tri-directional fiberglass/polyester scrim-reinforced metalized polyester.
  - b. Permeance (ASTM E 96 Procedure A, Desiccant Method): 0.02 perm.
  - c. Bursting Strength (ASTM D 774): 100 psi.
  - d. Puncture Resistance (ASTM C 1136): 125 beach units.
  - e. Tensile Strength (ASTM C 1136): 55 pounds per inch-width (MD), 50 pounds per inch-width (XD).
  - f. Thickness (Micrometer): 0.009 inches.
  - g. Accelerated Aging (30 days at 95% relative humidity, 120°F): No Corrosion or delamination.
  - h. Low Temperature Resistance (ASTM D 1790): Remains flexible, no delamination.
  - i. High Temperature Resistance (4 hours at 240°F): Remains flexible, no delamination.
  - j. Water Immersion (24 hours at 73°F): No delamination.
  - k. Mold Resistance (ASTM C 665): No growth.
  - l. Dimensional Stability (ASTM D 1204): 25%
  - m. Light Reflectance (ASTM C 523): 85%.



- n. Fire Testing per UL 723
  - 1) Flame Spread: Polypropylene exposed, 5; polyester exposed, 5.
  - 2) Smoke Developed: Polypropylene exposed, 25; polyester exposed, 20.

### 2.5 PERSONNEL DOOR AND FRAME MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, commercial quality, with G60 coating designation; mill phosphatized.

### 2.6 FABRICATION, GENERAL

- A. General: Design components and field connections required for erection to permit easy assembly and disassembly.
  - 1. Fabricate components in a manner that once assembled in the shop, they may be disassembled, repackaged, and reassembled in the field.
  - 2. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
  - 3. Fabricate framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Cold-formed members shall be free of cracks, tears, and ruptures.
- B. Primary Framing: Shop-fabricate framing components to indicated size and section with base plates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
  - 1. Make shop connections by welding or by using high-strength bolts.
  - 2. Join flanges to webs of built-up members by a continuous submerged arc-welding process.
  - 3. Brace compression flange of primary framing by angles connected between frame web and purlin or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
  - 4. Weld clips to frames for attaching secondary framing members.
  - 5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 1 and SSPC-SP 2. Shop prime primary structural members with standard primer after fabrication.
- C. Secondary Framing: Shop-fabricate framing components to indicated size and section by roll-forming or break-forming, with base plates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing. Make shop connections by using non-high-strength bolts.
- D. Factory Priming: Prime primary steel framing members with standard primer to a minimum dry film thickness of 1 mil.
- E. Tolerances: Comply with MBMA's "Metal Building Systems Manual": Chapter IV, Section 9, "Fabrication and Erection Tolerances."

### 2.7 STRUCTURAL FRAMING

- A. Primary Framing – Main Frames: Corle's standard structural primary framing systems shall be designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing. Standard configurations are as follows:
  - 1. Frame Types:
    - a. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.
    - b. Rigid Modular Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide interior columns fabricated from round steel pipe or tube; structural-steel shapes; or shop-welded, built-up steel plates.

2. Frame Configurations:
    - a. Single gable.
    - b. Single-directional sloped.
    - c. Lean to, with high side connected to, and supported by, another structure.
    - d. Multiple-gable.
    - e. Load-bearing-wall type.
    - f. Multistory.
  3. Exterior Column Types: Uniform depth or tapered.
  4. Rafter Type: Uniform depth or tapered.
- B. Primary Framing – End-Walls: Manufacturer's standard end-wall interior columns, corner columns, and rafters shall be fabricated for field-bolted assembly, from structural-steel shapes or shop-welded, built-up steel plates.
- C. Secondary Framing: Manufacturer's standard secondary framing members, including purlins, girts, eave struts, flange bracing, gable angles, clips, headers, jambs, and other miscellaneous structural members. Fabricate framing from cold-formed, structural-steel sheet or roll-formed, galvanized steel sheet, unless otherwise indicated, to comply with the following:
1. Purlins and Girts
    - a. Profiles
      - 1) C-shaped sections formed with stiffening lips angled 90 degrees to flange and minimum 3½-inch-wide flanges.
      - 2) Z-shaped sections formed with stiffening lips angled 45 to 50 degrees to flange and with minimum 2½-inch-wide flanges.
    - b. Available material thicknesses: 0.0620 inches, 0.0720 inches, and 0.0920 inches.
    - c. Available Depths: 8 inches, 10 inches, 11½ inches, and 12 inches.
  2. Eave Struts: Unequal-flange, C-shaped sections; fabricated from 0.0620-inch-, 0.0720-inch-, and/or 0.0920-inch-thick steel sheet to provide adequate backup for both roof and wall panels. The bottom flanges shall be 3½ inches wide, minimum. The web depth, top flange width, and flange and lip angles shall be dictated by the roof slope. The stiffening lips shall be parallel to the web.
  3. Lateral Bracing: 1- by 1-inch structural-steel angles, with a minimum thickness of 1/8 inch, to stiffen primary frame flanges.
  4. Base or Sill Angles: Minimum 3-by-2-by-0.0620-inch zinc-coated (galvanized) steel sheet.
  5. Purlin and Girt Connection Clips: Minimum 0.0620-inch-thick, zinc-coated (galvanized) steel sheet.
  6. Framing for Openings: C-shaped sections formed with stiffening lips angled 90 degrees to flange and minimum 3½-inch-wide flanges; fabricated from 0.0620-inch-, 0.0720-inch-, and/or 0.0920-inch-thick steel sheet, for framing head and jambs of door openings, and head, jambs, and sill of other openings.
  7. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.
- D. Canopy Framing: Manufacturer's standard structural-framing system, designed to withstand required loads, fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide frames with attachment plates and splice members, factory drilled for field-bolted assembly.
1. Type: Straight-beam, eave type.
  2. Type: Purlin-extension type.
  3. Type: Tapered-beam, below-eave type.
  4. Type: As indicated.
- E. Bracing shall be one of the methods listed below, based on specified requirements, building geometry, and design loads.

1. Cable: ¼-inch-, 3/8-inch, and/or 1/2-inch diameter with eye-bolt end anchors.
  2. Rigid Portal Frames: Fabricate from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
  3. Fixed-Base Columns: Fabricate from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
  4. Diaphragm Action of Panels: Diaphragm capacity values are available for the Corle Ribbed Panel (R-Panel) and Corle Architectural Panel (A-Panel), described herein. These are listed below:
    - a. 0.0190-inch (Corle A, 26-gage): \_\_\_\_\_ pounds per foot.
    - b. 0.0190-inch (Corle R, 26-gage): \_\_\_\_\_ pounds per foot.
    - c. 0.0236-inch (Corle R, 24-gage): \_\_\_\_\_ pounds per foot.
- F. Bolts: Provide shop-painted bolts unless structural-framing components are in direct contact with roof and wall panels. Provide zinc-plated bolts when structural-framing components are in direct contact with roof and wall panels.

### 2.8 ROOF AND FASCIA PANELS

#### A. Corle Ribbed Panel (R-Panel)

1. Profile: Lap-seam roof panels fabricated from metallic-coated steel sheets or prepainted with coil coating, factory formed to provide 36-inch coverage, with 1.25-inch-high raised trapezoidal major ribs at 12 inches o.c., and two (2) intermediate stiffening ribs symmetrically spaced between adjacent major ribs for full length of panel. Panels designed for mechanical attachment to structure using exposed fasteners, lapping major ribs at panel edges.
2. Available Materials
  - a. Available Finishes, Exposed
    - 1) Galvalume® Plus: Aluminum-zinc alloy-coated steel.
    - 2) TRINAR®: Fluoropolymer two-coat System over aluminum-zinc alloy-coated steel:
      - a) General: Corle's standard two-coat, thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a total minimum dry film thickness of 1 mil and 30 percent reflective gloss when tested according to ASTM D 523.
      - b) When field tested under normal range of weather conditions for a minimum of 20 years, the coating shall perform without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of five Hunter units.
      - c) Colors: Select from Corle's standard color chart. Other colors are available as special orders.
  - b. Finish, concealed: Coil manufacturer's standard backer finish, consisting of the following products manufactured by Akzo Nobel Coatings, Inc.: Bonderite 1303 pretreatment, UV9R24235A primer, and PW4R28555 white polyester coat with a total minimum dry film thickness of 0.5 mil.
  - c. Yield Strengths: 80 ksi standard, 50 ksi for Florida Approved.
  - d. Metal Thicknesses: 0.0190-inch or 0.0236-inch.

#### B. Standing-Seam Roof Panels: Manufacturer's standard panels complying with the following:

1. Available Corle Profiles



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- a. Corle Snap Seal (CSS): Snap-together seamed trapezoidal-ribbed roof panels, fabricated from metallic-coated steel sheets plain or prepainted with coil coating, factory formed to provide 18-inch or 24-inch coverage; with 3-inch-high (including seam) raised trapezoidal major ribs at panel edges, and intermediate stiffening ribs symmetrically spaced between major ribs for full length of panel.
  - b. Corle Seam-Lok (CSL): Double-folded mechanically seamed trapezoidal-ribbed roof panels fabricated from metallic-coated steel sheets plain or prepainted with coil coating, factory formed to provide 18-inch or 24-inch coverage; with 3-inch-high (including seam) raised trapezoidal major ribs at panel edges, and intermediate stiffening ribs symmetrically spaced between major ribs for full length of panel.
  - c. Corle Vertical-Lok (CVL): Double-folded mechanically seamed vertical-rib roof panels fabricated from metallic-coated steel sheets plain or prepainted with coil coating, factory formed to provide 18-inch coverage; with 2-inch-high inverted-L vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between major ribs for full length of panel.
2. Available Materials
- a. Available Finishes, Exposed
    - 1) Galvalume® Plus: Aluminum-zinc alloy-coated steel.
    - 2) TRINAR®: Fluoropolymer two-coat System over aluminum-zinc alloy-coated steel:
      - a) General: Corle’s standard two-coat, thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a total minimum dry film thickness of 1 mil and 30 percent reflective gloss when tested according to ASTM D 523.
      - b) When field tested under normal range of weather conditions for a minimum of 20 years, the coating shall perform without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of five Hunter units.
      - c) Colors: Select from Corle’s standard color chart. Other colors are available as special orders.
  - b. Finish, concealed: Coil manufacturer's standard backer finish, consisting of the following products manufactured by Akzo Nobel Coatings, Inc.: Bonderite 1303 pretreatment, UV9R24235A primer, and PW4R28555 white polyester coat with a total minimum dry film thickness of 0.5 mil.
  - c. Yield Strength: 50 ksi.
  - d. Metal Thicknesses: 0.0236-inch.
  - e. Clip System: Fixed or floating to accommodate thermal movement.

### 2.9 WALL PANELS

#### A. Corle Ribbed Panel (R-Panel)

1. Profile: Lap-seam wall panels fabricated from metallic-coated steel sheets plain or prepainted with coil coating, factory formed to provide 36-inch coverage, with 1.25-inch-high raised trapezoidal major ribs at 12 inches o.c., and two (2) intermediate stiffening ribs symmetrically spaced between adjacent major ribs for full length of panel. Panels designed for mechanical attachment to structure using exposed fasteners, lapping major ribs at panel edges.
2. Materials
  - a. Available Finishes, Exposed



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- 1) Galvalume® Plus: Aluminum-zinc alloy-coated steel.
- 2) TRINAR®: Fluoropolymer two-coat System over aluminum-zinc alloy-coated steel:
  - a) General: Corle's standard two-coat, thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a total minimum dry film thickness of 1 mil and 30 percent reflective gloss when tested according to ASTM D 523.
  - b) When field tested under normal range of weather conditions for a minimum of 20 years, the coating shall perform without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of five Hunter units.
  - c) Colors: Select from Corle's standard color chart. Other colors are available as special orders.
- b. Finish, concealed: Coil manufacturer's standard backer finish, consisting of the following products manufactured by Akzo Nobel Coatings, Inc.: Bonderite 1303 pretreatment, UV9R24235A primer, and PW4R28555 white polyester coat with a total minimum dry film thickness of 0.5 mil.
- c. Available Yield Strengths: 80 ksi standard, 50 ksi for Florida Approved.
- d. Available Metal Thicknesses: 0.0190-inch or 0.0236-inch.

### B. Corle Ribbed Panel (R-Panel), Reverse-Rolled

1. Profile: Lap-seam wall panels fabricated from metallic-coated steel sheets plain or prepainted with coil coating, factory formed to provide 36-inch coverage, with 1.25-inch-high recessed trapezoidal major valleys at 12 inches o.c., and two (2) intermediate stiffening valleys symmetrically spaced between adjacent major ribs for full length of panel. Panels designed for mechanical attachment to structure using exposed fasteners, lapping major ribs at panel edges.
2. Materials
  - a. Available Finishes, Exposed
    - 1) Galvalume® Plus: Aluminum-zinc alloy-coated steel.
    - 2) TRINAR®: Fluoropolymer two-coat System over aluminum-zinc alloy-coated steel:
      - a) General: Corle's standard two-coat, thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a total minimum dry film thickness of 1 mil and 30 percent reflective gloss when tested according to ASTM D 523.
      - b) When field tested under normal range of weather conditions for a minimum of 20 years, the coating shall perform without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of five Hunter units.
      - c) Colors: Select from Corle's standard color chart. Other colors are available as special orders.
  - b. Finish, concealed: Coil manufacturer's standard backer finish, consisting of the following products manufactured by Akzo Nobel Coatings, Inc.: Bonderite 1303 pretreatment, UV9R24235A primer, and PW4R28555 white polyester coat with a total minimum dry film thickness of 0.5 mil.
  - c. Available Yield Strengths: 80 ksi.
  - d. Available Metal Thicknesses: 0.0190-inch or 0.0236-inch.



# General Specifications

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### C. Corle Architectural Panel (A-Panel)

1. Profile: Lap-seam wall panels fabricated from metallic-coated steel sheets or prepainted with coil coating, factory formed to provide 36-inch coverage, with 1.125-inch-high recessed trapezoidal major valleys at 12 inches o.c., and five (5) intermediate creases symmetrically spaced between adjacent major ribs for full length of panel. Panels designed for mechanical attachment to structure using exposed fasteners, lapping major ribs at panel edges.
2. Materials
  - a. Available Finishes, Exposed
    - 1) Galvalume® Plus: Aluminum-zinc alloy-coated steel.
    - 2) TRINAR®: Fluoropolymer two-coat System over aluminum-zinc alloy-coated steel:
      - a) General: Corle's standard two-coat, thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a total minimum dry film thickness of 1 mil and 30 percent reflective gloss when tested according to ASTM D 523.
      - b) When field tested under normal range of weather conditions for a minimum of 20 years, the coating shall perform without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of five Hunter units.
      - c) Colors: Select from Corle's standard color chart. Other colors are available as special orders.
  - b. Finish, concealed: Coil manufacturer's standard backer finish, consisting of the following products manufactured by Akzo Nobel Coatings, Inc.: Bonderite 1303 pretreatment, UV9R24235A primer, and PW4R28555 white polyester coat with a total minimum dry film thickness of 0.5 mil.
  - c. Yield Strength: 50 ksi.
  - d. Available Metal Thicknesses: 0.0190-inch or 0.0236-inch.

### 2.10 LINER AND SOFFIT PANELS: Corle Ribbed Panel (R-Panel)

- A. Profile: Lap-seam roof panels fabricated from metallic-coated steel sheets or prepainted with coil coating, factory formed to provide 36-inch coverage, with 1.25-inch-high raised trapezoidal major ribs at 12 inches o.c., and two (2) intermediate stiffening ribs symmetrically spaced between adjacent major ribs for full length of panel. Panels designed for mechanical attachment to structure using exposed fasteners, lapping major ribs at panel edges.
- B. Available Materials
  1. Available Finishes, Exposed
    - a. Galvalume® Plus: Aluminum-zinc alloy-coated steel.
    - b. White Siliconized-Polyester Coating: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.7 mil for topcoat.
  2. Finish, concealed: Coil manufacturer's standard backer finish, consisting of the following products manufactured by Akzo Nobel Coatings, Inc.: Bonderite 1303 pretreatment, UV9R24235A primer, and PW4R28555 white polyester coat with a total minimum dry film thickness of 0.5 mil.
  3. Yield Strength: 80 ksi.
  4. Metal Thicknesses: 0.0140-inch or 0.0190-inch.



### 2.11 TRANSLUCENT PANELS

- A. Material: Glass-fiber-reinforced polyester, translucent white plastic; complying with ASTM D 3841, Type CC2, Grade 2; weather-resistant, smooth finish on both sides; weighing not less than the following. Match profile of adjacent metal panels.
  - 1. Panel Weight: Not less than 7.2 oz./sq. ft.
  - 2. Light Transmittance: Not less than 55 percent according to ASTM D 1494.
- B. Fire-Test-Response Characteristics: Provide panels tested as identical products per ASTM by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. UL 790
  - 2. ASTM D 2843-70
  - 3. ASTM D 1928-68
  - 4. ASTM D 635-74

### 2.12 PERSONNEL DOORS AND FRAMES

- A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
  - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- B. Self-Framing Personnel Doors: Corle doors and frames are fabricated to receive factory-applied hardware according to ANSI/DHI A115 Series:
  - 1. Steel Doors: 1-3/4 inches thick; fabricated from 0.0359- or 0.478-inch-thick, zinc-coated (galvanized) steel face sheets with 0.0598-inch-thick, inverted zinc-coated (galvanized) steel channels flush-mounted to top and bottom of door to prevent water intrusion.
    - a. Face Sheets: Smooth or textured.
    - b. Core: Polyurethane foam with U-value rating of at least 0.07 Btu/sq. ft. x h x deg F (R 14.97).
    - c. Frames shall have 6 5/16-inch by 16-inch x 0.1046-inch-thick (galvanized) steel reinforcement at the closer location and 0.1793-inch-thick hinge reinforcements at the hinge locations.
    - d. Glazing Frames: Steel frames to receive field-installed glass.
      - 1) Size:
        - a) Narrow Lite: 6-inch by 30-inch.
        - b) Vision: 16-inch by 16-inch.
        - c) Half glass: 24-inch by 30-inch.
      - 2) Glazing:
        - a) Standard.
        - b) Insulated.
  - 2. Steel Frames: Factory-welded double-rabbeted 2-inch-wide face frames from 0.0620-inch-thick, zinc-coated (galvanized) steel sheet, with 5/8-inch stops.
  - 3. Subframing: Galvanized 0.0620-inch-thick C-shaped sections to match girt depth.
  - 4. Hardware: Comply with ANSI/DHI A115 Series and the following:
    - a. Hardware shall be located according to DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

- b. Provide hardware for each door leaf, as follows:
  - 1) Hinges: One-and-one-half-pair, full-mortise, steel template ball-bearing hinges, 4-1/2 by 4-1/2 inches, with non-removable pin.
  - 2) Lockset: meeting Federal Specifications FF-H-106H, Series 160, and ANSI 4000, Grade II, provide one of the following:
    - a) Key-in-knob cylindrical type.
    - b) Mortise type.
    - c) Lever type.
    - d) Mortise with lever type.
  - 3) Panic Device: Touch-bar or push-bar type.
  - 4) Threshold: Saddle type extruded aluminum, mill finish.
  - 5) Closer: Surface-applied, parallel arm, standard-duty or heavy-duty hydraulic type.
  - 6) Weather Stripping: Kerf applied to head and jamb stops.
  - 7) Sweep: Three-finger, concealed.
- c. Provide each pair of double doors with the following hardware in addition to that specified for each leaf:
  - 1) Astragal: Z-style.
  - 2) Surface Bolts: Top and bottom of inactive door.
- 5. Anchors and Accessories: Manufacturer's standard units, galvanized according to ASTM A 123.
- 6. Fabrication: Fabricate doors and frames to be rigid; neat in appearance; and free from defects, warp, or buckle. Provide continuous welds on exposed joints; grind, dress, and make welds smooth, flush, and invisible.
- 7. Finishes: Comply with the following for personnel doors and frames:
  - a. Surface Preparation: Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
    - 1) Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20.
  - b. Factory Finish: Apply manufacturer's standard lead- and chromate-free, shop primer and finish coat immediately after surface preparation and pretreatment.

## **2.13 WINDOWS**

- A. Aluminum Windows: Aluminum windows shall be WinTech Series 2255 MBS Thermal Fin complying with the following:
  - 1. Performance Requirements: Tested for compliance with requirements in AAMA 101 for air infiltration; water penetration; and structural performance for type, grade, and performance class required.
  - 2. Window Types, Grade, and Performance Class: Provide windows of the following type, grade, and performance class according to AAMA 101:
    - a. Horizontal Sliding Units: AAMA Grade and Performance Class HS-C25.
    - b. Project-in Hopper Units: AAMA Grade and Performance Class P-C30.
    - c. Fixed Units: AAMA Grade and Performance Class F-HC40.



3. Aluminum Extrusions: 6063-T5, alloy and temper, 0.055-inch thickness at any location for main frame and sash members.
    - a. Thermally Improved Construction: Fabricate window units with an integral, concealed, low-conductance poured-in-place polyurethane or rigid polyvinylchloride thermal barrier; located between exterior materials and window members exposed on interior; in a manner that eliminates direct metal-to-metal contact.
  4. Fasteners: Zinc-plated. Fasteners shall not be exposed, except for attaching hardware.
    - a. Reinforcement: Where fasteners screw anchor into aluminum less than 0.125-inch-thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard, noncorrosive, pressed-in, splined grommet nuts.
  5. Hardware: Manufacturer's standard; of die-cast steel, malleable iron, or bronze; with steel or bronze operating arms, including the following:
    - a. Horizontal Slider Units
      - 1) Painted zinc die-cast sweep latch which mechanically retains the frame meeting rail. Spring-loaded latches shall not be permitted.
      - 2) Sash roller system shall consist of injection-molded nylon roller housing with brass tire on a stainless-steel axle Nylon or one-piece brass roller-axle assemblies shall not be permitted.
    - b. Project-in Hopper Units
      - 1) Cam-handle sash lock with a concealed pawl, painted to match the window finish, and a steel strike.
  6. Weather Stripping
    - a. Horizontal Slider Units: Woven-pile medium density polypropylene pile with Mylar fin, or equal.
    - b. Project-in Hopper Units: Co-extruded Santoprene with a polypropylene backer or equal.
  7. Insect Screens: Removable insect screen on each operable exterior sash, with screen frame finished to match window unit, and complying with the following:
    - a. Glass-Fiber Mesh: 18-by-16 mesh woven and fused to form a fabric mesh, complying with ASTM D 3656.
    - b. Frames: Painted roll-formed aluminum.
  8. Finish: Mill.
  9. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's specifications for cleaning, conversion coating, and painting.
    - a. Organic Coating: Thermosetting, modified-acrylic enamel system complying with AAMA 603.8 except with a minimum dry film thickness of 0.7 mil medium gloss on exposed areas.
- B. Glazing: Provide the following glazing materials:
1. Clear Float Glass: ASTM C 1036, Type I, Class 1, Quality q3, 2 or 3 mm thick.
  2. Tempered Glass: ASTM C 1048, Kind HS or FT, Condition A, Type I, Quality q2, Class 1 (clear), 3 mm thick.
  3. Tinted Float Glass: ASTM C 1036, Type I, Class 2, Quality q3, 3 mm thick.
  4. Patterned Float Glass: ASTM C 1036, Type II, Class 1 (clear), Form 3 (patterned), Quality q7, Pattern p3 (random), 3 mm thick.

5. Insulating Glass: Units consisting of two lites of 2-mm-thick clear float glass and air space, with a total overall unit thickness of not less than [5/8 inch to 1 inch]. Seal with manufacturer's standard sealant.
6. Glazing Stops: Snap-on glazing stops, coordinated with window type indicated. Finish shall match color of window units.
  - a. Horizontal Slider Units: Rigid extruded Polyvinylchloride.
  - b. Project-in Hopper and Fixed Units: Aluminum.
7. Pre-glazed Fabrication: Window units shall be pre-glazed window at the factory.

### 2.14 ACCESSORIES

- A. Provide components required for complete panel assemblies including trim, copings, fasciae, sills, corner units, ridge closures, clips, flashings, gutters, closure strips, and similar items. Match materials and finishes of roof panels, unless otherwise indicated.
- B. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of roof or wall sheets by means of plastic caps or factory-applied coating. Comply with the following:
  1. Fasteners for Roof and Wall Panels: Self-drilling/self-tapping, zinc-plated, hex-head carbon-steel screws, with a zinc-aluminum-alloy head and EPDM sealing washer.
  2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
  3. Blind Fasteners: Stainless-steel rivets for plain Galvalume® material, painted steel for Trinar®-coated material.
- C. Flashing and Trim: Form from 0.0190-inch-thick, aluminum-zinc alloy-coated steel sheet plain or prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent roof or wall panels.
  1. Opening Trim: Minimum 0.0190-inch-thick steel sheet. Trim head and jamb of door openings, and head, jamb, and sill of other openings.
- D. Gutters: Form from 0.0190-inch-thick, aluminum-zinc alloy-coated steel sheet, plain or prepainted with coil coating. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in 195- and/or 243-inch-long sections, sized according to SMACNA's *Architectural Sheet Metal Manual*. Furnish gutter supports spaced 24 inches o.c., fabricated from same metal as gutters. Finish gutters to match roof fascia and rake trim.
- E. Downspouts: Form from 0.0190-inch-thick, aluminum-zinc alloy-coated steel sheet, plain or prepainted with coil coating; in 3-inch by 4-inch or 4-inch by 5-inch 10-foot-long sections, complete with formed 75- degree elbows and offsets. Finish downspouts to match wall panels.
- F. Foam Closures: Closed-cell, laminated polyethylene; minimum 1-inch-thick, flexible closure strips; premolded to match roof and wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
  1. Outside closure for ridge condition of R-Panel roofs with slopes greater than 1:12.
  2. Inside closure for eave condition of R-Panel roofs (optional).
  3. Inside closure for base condition of R-Panel walls (optional).
  4. Outside closure for gable (rake) condition of A-Panel, R-Panel, and Reverse-Rolled R-Panel walls (optional).
  5. Inside closure for eave condition of A-Panel, R-Panel, and Reverse-Rolled R-Panel walls (optional).

- G. Metal Closures: Provide closures at eave and ridge for the following applications:
  - 1. Outside closure for ridge condition of standing seam roof systems, fabricated from 0.0239-inch-thick steel.
  - 2. Inside closure for eave condition of standing seam roof systems, fabricated from 0.0478-inch-thick steel.
- H. Standing Seam Roof Clips: Configuration shall be fixed or floating, as required by substrate conditions and/or roof geometry.
- I. Standing Seam Roof Backing Plates: Fabricated from 0.0620-inch thick steel.
- J. Standing Seam Roof Thermal Spacer Blocks: Provide thermal spacer blocks; fabricated from extruded polystyrene, in the following thicknesses.
  - 1. 3/8-inch: for low clip system with 3-inch insulation.
  - 2. 3/8-inch: for high clip system with 6-inch insulation.
  - 3. 5/8-inch: for high clip system with 4-inch insulation.
  - 4. 1-inch: for high clip system with 3-inch insulation.
- K. Roof Curbs: Fabricate curbs from 0.0478-inch-thick, minimum, aluminum-zinc alloy-coated (Galvalume®) steel sheet plain or prepainted with coil coating; with welded top box and bottom skirt, and integral full-length cricket/water-diverter. Finish roof curbs to match roof panels unless otherwise indicated.
  - 1. Insulate roof curb with 1½-inch-thick rigid insulation.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, with Erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of metal building system.
  - 1. For the record, prepare written report, endorsed by Erector, listing conditions detrimental to performance of work.
  - 2. Proceed with erection only after unsatisfactory conditions have been corrected.
- B. Before erection proceeds, survey elevations and locations of concrete and masonry bearing surfaces, base plates, and anchor bolts to receive structural framing. Verify compliance with requirements and metal building system manufacturer's tolerances.
  - 1. Engage land surveyor to perform surveying.

#### **3.2 PREPARATION**

- A. Clean substrates of substances, including oil, grease, rolling compounds, incompatible primers, and/or loose mill scale that impair bond of erection materials.
- B. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

#### **3.3 ERECTION**

- A. Erect metal building system according to Corle's written instructions and erection drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing in locations and to elevations indicated and according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

- D. Base plates, Leveling Plates, and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces before setting base plates and bearing plates. Clean bottom surface of base plates and bearing plates.
  - 1. Set base plates and bearing plates for structural members on wedges, shims, or setting nuts.
  - 2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base plate or bearing plate before packing with grout.
  - 3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow grout to cure.
    - a. Comply with manufacturer's written instructions for proprietary grout materials.
- E. Align and adjust framing members before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Make adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.
- F. Primary Framing and End Walls: Erect framing true to line, level, plumb, rigid, and secure. Level base plates to a true even plane with full bearing to supporting structures and set elevations by installing shims and tightening anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist cure grout for not less than seven days after placement.
  - 1. Make field connections using high-strength bolts. Tighten bolts by turn-of-the-nut method.
- G. Secondary Framing: Erect framing true to line, level, plumb, rigid, and secure. Fasten secondary framing to primary framing using bolts indicated on erection drawings. Hold rigidly to a straight-line temporary support until permanent supports, i.e., panel and/or bracing angles, are installed.
  - 1. Provide rake or gable purlins with rake angle and fasciae.
  - 2. Locate canopy framing as indicated.
  - 3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Steel Joists: Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.
  - 1. Before installation, splice joists delivered to Project site in more than one piece.
  - 2. Space, adjust, and align joists; and plumb and align supporting framing accurately in location before permanently fastening.
  - 3. Install temporary bracing and bridging, connections, and anchors to ensure that joists are stabilized during construction.
  - 4. Weld joists to supporting steel framework, unless otherwise indicated.
  - 5. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
- I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
  - 1. Tighten rod and cable bracing to avoid sag.
  - 2. Locate interior end bay bracing only where indicated.
- J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to building structural frame.

### 3.4 ROOF PANEL INSTALLATION

- A. General: Roof panels of full length from eave to ridge shall be provided when possible. Install panels perpendicular to purlins.
1. Field cutting by torch is not permitted.
  2. Rigidly fasten eave end of roof panels and allow ridge end free movement due to thermal expansion and contraction.
  3. Provide weather seal under ridge cap.
  4. Flash and seal roof panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws.
  5. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes when required by the specified fastener.
  6. Locate and space fastenings in true vertical and horizontal alignment.
  7. Install ridge caps as roof panel work proceeds.
  8. Locate standing seam panel splices and lap seam panel expansion splices over, but not attached to, structural supports.
- B. Lap-Seam Roof Panels: Fasten roof panels to purlins with exposed fasteners at each lapped joint at location and spacing determined by Corle.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed sheets one full rib. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
  2. Locate and space exposed fasteners in true vertical and horizontal alignment.
  3. Provide sealant tape at lapped joints of roof panels and between panels and protruding equipment, vents, and accessories.
  4. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps, and on side laps of nesting-type panels.
  5. At panel splices, nest panels with minimum 8-inch end lap, sealed with sealant tape and fastened together by screws penetrating both panel thicknesses into secondary framing below.
- C. Standing-Seam Roof Panels: Fasten roof panels to purlins with concealed clips at each standing-seam joint. Install clips over top of insulation at each purlin.
1. Install clips to supports with self-drilling fasteners.
  2. Crimp standing seams with manufacturer-approved motorized seamer tool so clip, panel, and factory applied side-lap sealant are completely engaged.
  3. At panel splices, nest panels with minimum 3-inch end lap, sealed with sealant tape and fastened together by interlocking clamping plates.

### 3.5 WALL PANEL INSTALLATION

- A. General: Wall panels of full height from base to eave or rake shall be provided when possible. Install panels perpendicular to girts.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Install panels with vertical edges plumb. Lap ribbed sheets one full rib. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
  2. Unless otherwise indicated, begin panel installation at corners with center of rib lined up with line of framing.
  3. Field cutting by torch is not permitted.
  4. Align bottom of wall panels and fasten with self-tapping screws.
  5. Fasten flashing and trim around openings and similar elements with self-tapping screws.
  6. When two rows of panels are required, lap panels 8 inches minimum. Locate panel splices over structural supports.

7. When building height requires two rows of panels at gable ends, align lap of gable panels over wall panels at eave height.
  8. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes when required by the specified fastener.
  9. Provide weather-resistant escutcheons for pipe and conduit penetrating exterior walls.
  10. Flash and seal wall panels with weather closures under eaves and rakes, along lower panel edges, and at perimeter of all openings.
  11. Apply sealant continuously between metal base channel or sill angle and concrete, and elsewhere as necessary for waterproofing. Handle and apply sealant and backup according to sealant manufacturer's written instructions.
  12. Locate and space fastenings in true vertical and horizontal alignment.
- B. Exterior Panel: Install wall panels on exterior side of girts. Attach panels to supports with fasteners as indicated in the Corle Building Systems *Erection & Detail Manual*.
- C. Liner Panels: Install panels on interior side of girts at locations indicated. Fasten with exposed fasteners as indicated in the Corle Building Systems *Erection & Detail Manual*.

### 3.6 TRANSLUCENT PANEL INSTALLATION

- A. Translucent Panels: Attach plastic panels to structural framing according to Corle Building Systems *Erection & Detail Manual*.
1. Provide end laps of not less than 8 inches and side laps of not less than 1½ inches for wall panels.
  2. Align horizontal laps with adjacent wall panels.
  3. Seal intermediate end laps and side laps of translucent panels with sealant tape.

### 3.7 FASCIA AND SOFFIT PANEL INSTALLATION

- A. General: Provide panels full width of fasciae and soffits. Install panels perpendicular to support framing.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Install panels with vertical edges plumb. Lap ribbed panels one full rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
  2. Field cutting by torch is not permitted.
  3. Fasten flashing and trim around openings and similar elements with self-tapping screws.
  4. Install screw fasteners with power tools having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
  5. Locate and space fastenings in true vertical and horizontal alignment.
- B. Fascia Panels: Align bottom of panels and fasten with self-tapping screws. Flash and seal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.
- C. Soffit Panels: Flash and seal panels with weather closures where soffit meets walls and at perimeter of all openings.

### 3.8 INSULATION INSTALLATION

- A. General: Install insulation concurrently with panel installation, according to manufacturer's written instructions and as follows:
1. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
  2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

- B. Blanket Insulation: Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths with both sets of facing tabs sealed to provide a complete vapor retarder. Comply with the following installation method:

### 3.9 DOOR INSTALLATION

- A. General: Comply with door manufacturer's written instructions for installing doors. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with sealant used for panels.
- B. Personnel Doors and Frames: Install doors and frames straight, level, and plumb. Securely anchor frames to building structure. Set units with maximum 1/8-inch clearance between door and frame at jambs and head and maximum 3/4-inch clearance between door and floor.
- C. Sliding Service Doors: Bolt support angles to opening head members through factory-punched holes. Bolt door tracks to supports as recommended by door manufacturer. Set doors and operating equipment with necessary hardware and supports.
- D. Replace glass that is broken or damaged to ensure that each piece of exterior glass is airtight and watertight through normal weather/temperature cycles and through normal door operation.
- E. Set thresholds for exterior doors in full bed of sealant.

### 3.10 WINDOW INSTALLATION

- A. General: Comply with window manufacturer's written instructions for installing window units, screens, hardware, operators, and other window components. Coordinate installation with wall flashings and other components.
- B. Set window units level, plumb, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
  - 1. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in "Dissimilar Materials" Paragraph in appendix to AAMA 101.
- C. Set sill members and other members in a bed of sealant to provide weathertight construction.
- D. Anchor windows securely in place. Seal perimeter of each unit with sealant used for panels.
- E. Glazing: Replace glass that is broken or damaged to ensure that each piece of exterior glass is airtight and watertight through normal weather/temperature cycles and through normal window operation.

### 3.11 ACCESSORY INSTALLATION

- A. General: Install gutters, downspouts, ventilators, louvers, and other accessories according to Corle Building Systems *Erection & Detail Manual*, with positive anchorage to building and weathertight mounting. Coordinate installation with flashings and other components.
- B. Flashing and Trim: Comply with performance requirements, Corle Building Systems *Erection & Detail Manual*, and SMACNA's "Architectural Sheet Metal Manual." Provide for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
  - 1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
- C. Gutters: Join sections with lapped and riveted joints. Attach gutters to eave with gutter hangers spaced not more than 2 feet o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant.

- D. Downspouts: Join sections with 1½-inch telescoping joints. Provide fasteners designed to hold downspouts securely away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
  - 1. Provide elbow at base of downspout to direct water away from building.
  - 2. Tie downspouts to underground drainage system.
- E. Continuous Roof Ventilators: Set ventilators complete with necessary hardware, anchors, dampers, weather guards, rain caps, and equipment supports according to manufacturer's written instructions. Join sections with splice plates and end-cap skirt assemblies where required to achieve indicated length. Install preformed filler strips at base to seal ventilator to roof panels.
- F. Louvers: Set louvers complete with necessary hardware, anchors, dampers, weather guards, and equipment supports according to manufacturer's written instructions. Locate and place louver units' level, plumb, and at indicated alignment with adjacent work.

### 3.12 ERECTION AND LOCATION TOLERANCES

- A. Structural-Steel Erection Tolerances: Comply with erection tolerance limits of AISC *Code of Standard Practice for Steel Buildings and Bridges*, 2005, except individual members are considered plumb, level, and aligned if the deviation does not exceed 1:300; and MBMA *2006 Metal Building Systems Manual*.
- B. Roof Panel Installation Tolerances: Shim and align units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Wall Panel Installation Tolerances: Shim and align units within installed tolerance of 1/4 inch in 20 feet on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- D. Door Installation Tolerances: Fit doors in frames within clearances specified in SDI 100.

### 3.13 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing agency to perform field quality- control testing.
- B. Extent and Testing Methodology: Testing and verification procedures will be required of high-strength bolted connections.
  - 1. Bolted connections will be visually inspected.
  - 2. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Load and Resistance Factor Design Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Testing agency will report test results promptly and in writing to Erector, Contractor, and Architect.

### 3.14 ADJUSTING

- A. Doors: After completing installation, lubricate, test, and adjust doors to operate easily, free from warp, twist, or distortion.
- B. Hardware: Adjust and check each operating item of hardware to ensure proper operation and function. Replace units that cannot be adjusted to operate freely and smoothly.
  - 1. Where door hardware is installed more than one month before acceptance or occupancy, make final check and adjustment of hardware items during the week before acceptance or occupancy. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.





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- C. Windows: Adjust operating ventilators and hardware to provide a tight fit at contact points and weather stripping, for smooth operation and a weathertight closure.
- D. Ventilators and Louvers: After completing installation, including work by other trades, lubricate, test, and adjust units to operate easily, free from warp, twist, or distortion.
  - 1. Adjust louver blades to be weathertight when in closed position.

### 3.15 CLEANING AND PROTECTION

- A. Touchup Painting: Immediately after erection, clean, prepare, and prime or reprime welds, bolted connections, and abraded surfaces of prime-painted primary, accessories, and bearing plates.
  - 1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
  - 2. Apply compatible primer of same type as shop primer used on adjacent surfaces.
- B. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and paint manufacturer's written instructions.
- C. Roof and Wall Panels: On completion of panel installation, clean finished surfaces as recommended by panel manufacturer and maintain in a clean condition during construction.
  - 1. Replace panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
- D. Doors: Immediately after erection, sand smooth any rusted or damaged areas of factory paint and apply touchup of compatible air-drying primer and/or finish coat.
- E. Windows: Clean metal surfaces promptly after installing windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts. Clean glass promptly after installing windows.
- F. Louvers: Provide temporary protective coverings where needed and approved by louver manufacturer. Remove protective covering at time of Substantial Completion.
  - 1. Restore louvers and vents damaged during installation and construction period, so no evidence remains of correction work. If results of restoration are unsuccessful, as judged by Architect, remove damaged units and replace with new units.
    - a. Clean and touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.
  - 2. Test operation of adjustable wall louvers and adjust as needed to produce fully functioning units.

END OF SECTION 13125