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Product Guide Specification

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including MasterFormat, SectionFormat, and PageFormat, as described in The Project Resource Manual—CSI Manual of Practice.

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all Specifier Notes when editing this section.

Section numbers and titles are from MasterFormat 1995 Edition, with numbers and titles from MasterFormat 2004 Edition in brackets. Delete version not required.

SECTION 07 42 00 [07422]

TONGUE & GROOVE WALL PANELS

Specifier Notes: This section covers Millennium Forms, LLC aluminum, stainless steel, and ZALMAG® Tongue and Groove wall panels. Consult Millennium Forms for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Stainless steel, aluminum, and ZALMAG® wall panels.
- B. Flashing and Trim integral to panels.
- C. Clips, anchoring devices, fasteners, and accessories for installation of panel system.

1.2 RELATED SECTIONS

Specifier Notes: Edit the following list of related sections as required for the project. List other sections with work directly related to this section.

- A. Section 06 10 00 [06100] – Rough Carpentry: Wall sheathing
- B. Section 07 25 00 [07270] – Air and Vapor Barriers
- C. Section 07 62 00 [07620] – Sheet Metal Flashing and Trim.
- D. Section 07 92 00 [07920] – Joint Sealants.

1.3 REFERENCES

Specifier Notes: List standards referenced in this section, complete with designations and titles. This article does not require compliance with

- A. ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015.
- B. ASTM D4479/D4479M – Standard Specifications for Asphalt Roof Coatings – Asbestos-Free; 2000
- C. ASTM E8/E8M – Standard Test Methods for Tension Testing of Metallic Materials; 2013.
- D. ASTM E18/E18M - Standard Test Methods for Rockwell Hardness of Metallic Materials; 2014.

1.4 DESIGN/ PERFORMANCE REQUIREMENTS

- A. ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015.
 - 1. System Design: Metal wall system as designed by the manufacturer shall be a complete system. All components of the system shall be supplied by the same manufacturer.
 - 2. Wall Panels: Wall panels shall be designed in accordance with the local building code using the Manufacturer's published Load Tables or review by a qualified design professional.
 - 3. Design Loads: Design load application shall be in accordance with local building code.
 - 4. Wind Loads: Design wind loads shall be based on the wind criteria in accordance with local building code.
 - 5. Deflection: Deflection requirements shall be in accordance with the applicable building code, or as a minimum, L/180 for wind load (but not less than 10 psf (49 kg/sq m).
 - 6. Accessories and Fasteners: Accessories and fasteners shall be capable of resisting the specified design wind suction forces in accordance with local building code.

1.5 SUBMITTALS

- A. See Section 01 33 00 [01300] – Submittal Procedures for additional requirements.
- B. Product Data: Submit manufacturer's product data, including sizes, surface preparation, and installation instructions.

Specifier Notes: Millennium Forms, LLC Light Interference Color (LIC) process is created through a prismatic separation of light on the surface of stainless steel. Light conditions, viewing angles and the standard tolerances of chemical recipes within stainless steel will create a variation in the perceived color. Additionally, each LIC color Millennium Forms, LLC offers is produced as a range of color (color range). Each tile, because of these differences, will be its own signature tile. Prior to production Millennium Forms, LLC will submit initial sample tiles in the specified color. The initial sample tiles are samples only and will not be an exact match to what will be provided for the project. The Project Reference photo or document is a representation of the color range that can be expected within the specified color. ("Color range" refers to the achievable: light, medium, dark range of a color.)

- C. Samples:
 - 1. Stainless Steel:
 - a. Initial Samples: Submit one (1) or more samples of stainless steel of each Light Interference Color (LIC) requested, to show the natural variation and color range possible.
 - b. Submittal Samples: Submit three (3) samples of stainless steel of each Light Interference Color (LIC) requested to show the natural variation and color range of the product using material specifically sourced for the project. (Color range refers to the achievable light, medium, dark range of a color.) Submittal samples of light, medium, and dark are sent to customer for approval. When applicable, three submittal sets, in the form of 10" x 10" are sent and should be dispersed to appropriate decision makers, i.e. we suggest the Architect and Building Owner should be receiving Submittals.
 - 2. Aluminum
 - a. Initial Samples: Submit one (1) or more samples of each color of aluminum requested.
 - 3. ZALMAG
 - a. Initial Samples: Submit one (1) or more samples of each finish of ZALMAG ® to show the Finish range possible.
- D. Specific Project Reference: Submit manufacturer photograph(s) showing design intent of the finish range that can be expected within wall panels.

- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Installation Instructions: Manufacturer's written instructions including surface preparation and installation procedures.
- G. LEED Submittals: Provide certificate stating average recycled content of steel products made up of postconsumer and preconsumer recycled content is not less than 70 percent.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, cool, and dry area in accordance with manufacturer's instructions.
- C. Handling: Protect materials during handling and installation to prevent damage. See manufacturer's Storage and Handling instructions.

1.7 WARRANTY

- A. See Section 01 78 00 – [01780] – Closeout Submittals for additional information.
- B. Submit manufacturer's standard limited liability warranty stating that wall panels will be free from manufacturing defects which adversely affect wall panel's performance.

Specifier Notes: Warranty is void and Millennium Forms, LLC is not responsible for any damages if the metal wall panels are installed using methods not adhering fully to the manufacturer's instructions.

PART 2 PRODUCTS

2.2 MANUFACTURER

- A. Millennium Forms, LLC, 550 East Centralia Street, Elkhorn, WI 53121 Phone 262.723.7778 Website www.millenniumforms.com E-mail info@millenniumforms.com
- B. Substitutions: Not allowed [See Section 01 60 00 [01600] – Product Requirements]

2.3 STAINLESS STEEL WALL PANELS

- A. Stainless Steel Wall Panels:
 - 1. Description: Factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
 - 2. Material: ASTM A240/A240M, stainless steel sheet.

Specifier Notes: Specify type of stainless steel. Type 316 has greater corrosion resistance and is typically used for marine applications. Type 316 should be specified for installations within 2 miles of seawater and salt air. Some urban applications due to high use of road salt will also require the use of Type 316. Consult others for site specific information. Type 316 has a premium when compared to Type 304.

Select appropriate material. Type 304 is default.

a. Type 304

Specifier Notes: Specify Size & Weight to be used on Project.

3. Size:
 - a. Tongue and Groove Panel: 1 inch x 8 inch nominal size
 - Exposure Width: 7.4 inches +/- 1/16 inch.
 - Return Groove Side: 0.85 inch
 - Return Tongue Side: 0.91 inch
 - Lapping Extension Groove Side: 2.16 inches
 - Lapping Extension Tongue Side: 1.49 inches
4. Weight: (mill tolerances apply)
 - a. 1 Panel 24 Gauge (0.024 inch Thick) : 1.142 plf
 - b. 1 Panel 22 Gauge (0.030 inch Thick) : 1.428 plf
5. Thickness: 0.024 inch, or 24 gauge; 0.030 inch, or 22 gauge (mill tolerances apply).
6. Density: 0.287 lbs./cu. in.
7. Temper: Annealed.
8. Tensile Strength, ASTM A240: 75,000 psi.
9. Yield Strength, ASTM A240, 0.2 Percent Extension Under Load: 30,000 psi.
10. Elongation, ASTM A240: 40 percent in 2 Inches.
11. Rockwell Hardness, ASTM E18/E18M: B82.
12. Thermal Conductivity: 9.2 BTU/sq. ft./hr./degree F at 68 degrees F.

Specifier Notes: Specify finish of material. Consult Millennium Forms, LLC for availability of different finishes. Mill (2B) is a matte looking surface finish and has less reflectivity when compared to bright. Bright (BA) is a mirror-like finish.

14. Finish:
 - a. 2B (mill) mill tolerances apply
 - b. BA (bright) mill tolerances apply

Specifier Notes: Select applicable materials and color(s), consult Millennium Forms LLC

Light Interference Color (LIC): is an electrochemical process to color stainless steel without the use of dyes or pigments. The process uses acids and electricity to grow a chrome oxide (chromate) layer on the stainless steel. The thickness of the chromate acts like a prism creating the changing color that is seen on the surface of the metal. As a result, each LIC color is produced with a range from light to dark. Specifier Notes: Select applicable color(s), consult Millennium Forms LLC

15. Color:
 - a. Natural (no color)
 - b. Pewter [satin etched surface available on Mill (2B) finish]
 - c. Bronze (LIC)
 - d. Charcoal [only available in #4 Polish finish] (LIC)
 - e. Blue (LIC)
 - f. Slate (LIC) [only available in 2B-Mill finish]
 - g. Bronze-Gold (LIC)
 - h. Burgundy (LIC)
 - i. Purple-Blue (LIC) [only available in Bright (BA) finish]
 - j. Peacock (LIC)
 - k. Blue-Green (LIC)

2.1 ALUMINUM WALL PANELS

- A. Aluminum Wall Panels:
 1. Description: Factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
 2. Material: [3003-H14, 5205, and/or 5005 Aluminum material dictated by color]
 - a. Base Material: ASTM B209, with smooth surface coil-coating.

Specifier Notes: Specify Size & Weight to be used on Project.

3. Size:
 - a. Tongue and Groove Panel: 1 inch x 8 inch nominal size
 - Exposure Width: 7.4 inches +/- 1/16 inch.
 - Return Groove Side: 0.85 inch
 - Return Tongue Side: 0.91 inch
 - Lapping Extension Groove Side: 2.16 inches
 - Lapping Extension Tongue Side: 1.49 inches

4. Weight: (mill tolerances apply)
 - a. 1 Panel (0.032 inch Thick) : 0.538 plf
 - b. 1 Panel (0.040 inch Thick) : 0.674 plf
5. Thickness: 0.032 inch +/- .002 inch (0.8mm), 0.040 inch +/- .002 inch (1.0 mm), mill tolerances apply.
6. Density: 0.284 lbs./cu. in.
7. Temper: Hot Rolled
8. Tensile Strength: ASTM B 209, 20,000 psi. (min.)
9. Yield Strength: ASTM B 209, 17,000 psi. (min.)
10. Elongation: ASTM B 209, 4%
11. Rockwell Hardness: ASTM E18, 40
12. Thermal Conductivity: 1100 BTU-in/hr-ft²-°F

Specifier Notes: Select applicable finish(es), contact Millennium Forms LLC for available color/finish options.

13. Finish:
 - a. Contact Millennium Forms LLC for available color/finish options

2.2 ZALMAG® WALL PANELS

- A. ZALMAG® Wall Panels:
 1. Description: Factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
 2. Material: ZALMAG®.
 - a. Base Material: ASTM A1046/A1046M, with corrosion-resistant coating.
 - b. Coating consists of Zinc, Aluminum & Magnesium.

Specifier Notes: Specify Size & Weight to be used on Project.

3. Size:
 - a. Tongue and Groove Panel: 1 inch x 8 inch nominal size
 - Exposure Width: 7.4 inches +/- 1/16 inch.
 - Return Groove Side: 0.85 inch
 - Return Tongue Side: 0.91 inch
 - Lapping Extension Groove Side: 2.16 inches
 - Lapping Extension Tongue Side: 1.49 inches
3. Weight: (mill tolerances apply)
 - a. 1 Panel 26 Gauge (0.018 inch Thick) : 0.857 plf
 - b. 1 Panel 24 Gauge (0.024 inch Thick) : 1.142 plf
4. Thickness: 0.018 inch +/- .002 inch (26-gage), 0.024 inch +/- .002 inch (24-gage), mill tolerances apply.
5. Density: 0.284 lbs./cu. in.
6. Temper: Hot Rolled
7. Tensile Strength: ASTM E8/E8M, 50,000 psi.

8. Yield Strength: ASTM E8/E8M, 27,600 psi.
9. Elongation: ASTM E8/E8M 22%
10. Rockwell Hardness: ASTM E18, 58
11. Thermal Conductivity: 360 BTU-in/hr-ft²-°F

Specifier Notes: Select applicable finish(es). ZALMAG® is offered in three (3) Finishes: Natural, Pre- Patina II, and Black. Pre-Patina II and Black Finish are coatings produced as a range. The range of Finish varies due to the natural variations in the base metal surface, as well as the ZALMAG®'s natural weathering process.

12. Finish:
 - a. Natural
 - b. Pre-Patina II
 - c. Black

2.3 ACCESSORIES

- A. Trim and Flashing: Same material and color as wall panels, except where otherwise noted; See Section 07 62 00 [07620] - Sheet Metal Trim and Flashing for additional fabrication requirements.

Specifier Notes: Edit the following list as required.

1. False Starter: 1-3/4 by 120 inches; 24-gauge
 2. Inside Corners: 6-1/8 by 6-1/8 by 120 inches; 24-gauge; consist of two (2) J-Channels and one (1) inside Corner Cap
 3. 1-Piece Outside Corners: 120 inches long; 24-gauge
 4. 3-Piece Outside Corners: 120 inches long; 24-gauge; consist of two (2) J-Channels and one (1) Outside Corner Cap (2 by 2 inches).
 5. J-Channels: 3-3/8 by 1/2 by 120 inches; 24-gauge
 6. Head Flashing: 1-1/2 by 1-3/4 by 120 inches; 24-gauge
- B. Underlayment: ASTM D 226/D 226M, Type II (No. 30) asphalt-saturated felt.
 - C. Air and Water Barrier: See Section 07 25 00 [07270] – Weather Barriers. Shall be rated for high-temperature resistance.
 - D. Fasteners: The fastener types selected shall be dictated by the wall panel material.
 1. Fastener Material:
 - a. Stainless Steel Panel: Stainless steel, ring-shank roofing nails or stainless steel screws. Fasteners must match alloy of panel material.
 - b. Aluminum Panel: Stainless steel, ring-shank roofing nails or stainless steel screws.
 - c. ZALMAG® Panel: Zinc Coated stainless steel ring-shank roofing nails or zinc coated stainless steel screws.

Specifier Note: The use of 410 stainless steel fasteners is prohibited for all tongue and groove panel material types. The warranty is void and Millenium Forms, LLC not responsible for any damages if the metal wall panels are installed using 410 stainless steel fasteners.

2. Minimum Length: 3d (1-1/4 inches)

E. Joint Sealants: Exterior-grade, high-temperature, silicone joint sealant, as specified in Section 07 92 00 [07920].

F. Bituminous Paint: Asphaltic mastic, ASTM D4479/D4479M, Type I.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive wall panels.

B. Notify Architect of conditions that would adversely affect installation.

C. Do not begin surface preparation or installation until unacceptable conditions are corrected.

D. Ensure wall sheathing is solid with a minimum thickness of:

1. Plywood: 1/2 inch.
2. Oriented Strand Board (OSB): 19/32 inch.

E. Ensure weather barrier is properly installed and undamaged.

3.2 SURFACE PREPARATION

A. Prepare surfaces in accordance with manufacturer's instructions.

B. Ensure surfaces to receive wall panels are smooth and even.

Specifier Note: Delete the following if not used in wall assembly.

C. Install drainage/ventilation mat in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. Install tongue and groove wall panels in accordance with manufacturer's instructions.

B. Pull panels from several boxes during the installation to ensure random color variation.

C. Install tongue and groove wall panels following the design span tables.

- D. Use specified fasteners at spacing in accordance with manufacturer's instructions.
- E. If your product has plastic protective film (PVC) on it, the plastic and metal product will keep better in a cool, dry environment. Immediately remove the plastic protective film as this can result in an easier removal process and also avoid undesirable adhesion transfer to the metal surface. Discretion is advised when scheduling the install of the product with plastic film.

Specifier Note: Most common source of galvanic action is from copper or galvanized sheet metal draining onto stainless steel.

- F. Prevent Electrolysis:
 - 1. Prevent dissimilar metals and corrosive nonmetallic materials from coming into direct contact with stainless steel materials.
 - 2. Do not allow water to flow from dissimilar metals to stainless steel materials.
- G. Install trim and flashing in accordance with manufacturer's instructions.
- H. Joint Sealants:
 - 1. Install joint sealants as specified in Section 07 92 00 [07920].
 - 2. Install joint sealants at overlapping flashing and exposed fastener heads.

3.4 PROTECTION

- A. Protect installed wall panels to ensure that, except for normal weathering, wall panels will be without damage or deterioration at time of substantial completion.

END OF SECTION