

- 1 A. Components: Design and size components to withstand dead and live loads caused by positive and
2 negative wind pressure acting normal to plane of wall as calculated in accordance with applicable code.
3 B. Movement: Accommodate movement within system without damage to components or movement within
4 system; movement between system and perimeter components when subject to seasonal temperature
5 cycling; dynamic loading and release of loads; deflection of structural support framing.
6 C. Provision for Thermal Movements:
7 1. Provide for expansion and contraction of component materials, as will be caused by an exterior ambient
8 temperature ranging from -10 degrees F to metal surface temperature of +180 degrees F, and an
9 interior temperature range of +50 degrees F to +100 degrees F, without causing buckling stresses on
10 glass or stone, failure of glass, metal, stone or joint seals, undue stress on structural elements,
11 damaging loads on fasteners, reduction of performance or other detrimental effects.
12 2. Provide accommodation for movement in the design and identified on submitted shop drawings,
13 accompanied by thermal calculations.
14 D. Deflection Criteria:
15 1. The deflection of metal panels, fascia or other sheet fabricated elements is not to exceed L/120 of the
16 span or 3/4 inch whichever is less or at specified design pressure. Deflection is to be measured relative
17 to the horizontal and vertical support members with the allowable deflection being determined by the
18 lesser dimension.
19 E. Anchors and Connections - General:
20 1. Anchors, connections and assemblies connecting the unitized window wall components and associated
21 fabrications to the supporting construction are shown on the Drawings as suggested locations and
22 details for the unitized window wall manufacturer/installer's information. The unitized window wall
23 manufacturer/installer is responsible for the structural design of the connections and anchors, including
24 all connecting hardware, accessories and reinforcing necessary for fabrication, assembly and
25 installation of the unitized window wall system and associated fabrications.
26 2. The unitized window wall manufacturer is to notify the Architect in writing prior to the submittal of shop
27 drawings of any changes in the proposed locations of connections and anchors.
28 3. The Architect's review of shop drawings is not to be construed as removing responsibility from the
29 unitized window wall manufacturer/installer for structural failures related to design, fabrication,
30 assembly, installation and fabrication service.
31 F. Cast-In-Place Concrete Inserts and Anchors: Headed concrete studs welded to steel elements and cast-in-
32 place with structural concrete are to have a minimum safety factor of 2.0 against ultimate failure. Unistrut
33 type or ferrule type concrete inserts are to have minimum safety factor of 3.0 against ultimate failure. All
34 drilled expansion or wedge type anchors are to have a minimum safety factor of 4.0 against ultimate failure.
35 Use of 1/3 increase for allowable stresses is not acceptable unless written approval by manufacturer is
36 provided.
37 G. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel
38 system.

39 **1.5 SUBMITTALS**

- 40 A. Submit under provisions of Section 013323 - Submittals.
41 B. Product Data: Manufacturer's data sheets on each product to be used, including:
42 1. Preparation instructions and recommendations.
43 2. Storage and handling requirements and recommendations.
44 3. Installation methods.
45 C. Shop Drawings: Indicate dimensions, layout, joints, expansion joints, construction details, methods of
46 anchorage, panelization dimensions and details, and interface with adjacent materials.
47 D. Sustainable Submittals: Provide documentation of how the requirements of Credits will be met:
48 1. Construction Waste Management: For products being recycled or reused, provide the following
49 documentation:
50 a. Summary log of all construction waste generated including tonnage or volume, type of waste, and
51 disposal methods, along with names of haulers and recyclers:
52 i. Include all waste materials for all projects that are applicable for this measure.
53 ii. Tabulate all waste materials, including both the recycled and disposed materials and
54 percentages of total.

- 1 b. Invoices from haulers and recycling firms that support the details in the summary log regarding
- 2 handling of waste.
- 3 2. Regional Materials: Product data for products that have been extracted, harvested, recovered, and/or
- 4 manufactured within 300 miles of project site, documentation to include:
- 5 a. Table summarizing all materials used including:
- 6 i. Item description.
- 7 ii. Place of manufacturing origin.
- 8 iii. Weight (or cost, if weight unavailable).
- 9 iv. Totals of the products sourced regionally versus outside of region along with percentages of
- 10 total.
- 11 b. Contractor's Schedule of Values.
- 12 3. Reused/Recycled Materials: Product data for products with reused, repurposed, or recycled material
- 13 content, documentation to include:
- 14 a. Total project(s) material cost.
- 15 b. Table summarizing all materials used, including:
- 16 i. Item description.
- 17 ii. Percentage of the material that is reused, recycled, or repurposed (or zero for virgin material).
- 18 iii. Weight (or cost, if weight unavailable).
- 19 iv. Total and percentages of virgin materials versus reused, recycled, and repurposed materials.
- 20 c. Contractor or manufacturer certifications that demonstrate the materials were reused, recycled, or
- 21 repurposed and the percentage of this content.
- 22 E. Selection Samples: For each finish product specified, two complete sets of color chips representing
- 23 manufacturer's full range of available colors and patterns.
- 24 F. Verification Samples: For each finish product specified, two batten samples, minimum size 4 inches (51 mm)
- 25 by 12 inches (89 mm), representing actual product, color, and gloss.
- 26 G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- 27 H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for
- 28 periodic cleaning and maintenance of components.

29 **1.6 QUALITY ASSURANCE**

- 30 A. Manufacturer Qualifications: Minimum ten years experience producing aluminum finishes of the types
- 31 specified in AAMA 2604 and 2605 Certified.
- 32 B. Installer: Company specializing in performing Work of this section with minimum three years documented
- 33 experience.
- 34 C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
- 35 1. Finish areas designated by Architect.
- 36 2. Do not proceed with remaining work until workmanship, color, and gloss are approved by Architect.
- 37 3. Refinish mock-up area as required to produce acceptable work.
- 38 4. ~~Mock up to be built on site, but separate from the finished work. Mock up may not be incorporated into~~
- 39 ~~the final work.~~

40 **1.7 DELIVERY, STORAGE, AND HANDLING**

- 41 A. Package and store products under cover in manufacturer's unopened packaging until ready for transport and
- 42 installation.
- 43 B. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- 44 C. Store prefinished material off ground protected from weather, to prevent twisting, bending, or abrasion, and
- 45 to provide ventilation. Slope metal sheets to ensure drainage.
- 46 D. Prevent contact with materials capable of causing discoloration or staining.

47 **1.8 PROJECT CONDITIONS**

- 48 A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by
- 49 manufacturer for optimum results. Do not fabricate products under environmental conditions outside
- 50 manufacturer's absolute limits.

1 **1.9 COORDINATION**

- 2 A. Coordinate Work with installation of windows, louvers, and adjacent components or materials.

3 **1.10 WARRANTY**

- 4 A. Manufacturer's limited lifetime warranty against cracking, peeling and gloss/color retention within the
5 guidelines stated by the American Aluminum Manufactures Association (AAMA).
6 1. Standard Colors:
7 a. Dulux Duratec - AAMA 2604 (5 Year Florida) 15 Year manufacturer's Warranty
8 b. Dulux Fluorosec - AAMA 2605 (10 Year Florida) 20 Year manufacturer's Warranty

9 **PART 2 – PRODUCTS**

10 **2.1 MANUFACTURERS**

- 11 A. Acceptable Manufacturer:
12 1. Knotwood LLC., which is located at: 6715 NE 63rd St. #223, Vancouver, WA 98661: info at
13 kleb@knotwood.com. Web: <https://knotwood.com/>.
14 **2. Or approved equal**
15 B. Substitutions per Section 012513 – Product Substitution Procedures.

16 **2.2 MATERIALS**

- 17 A. Extruded Aluminum Siding and Battens: Knotwood Aluminum Siding and Battens with Alluminate bonded
18 film finish on extruded aluminum.

19 **2.3 FINISHES**

- 20 A. Pretreatment: E-CLPS Chrome Free five stage aluminum pretreatment system. Complies with AAMA 2603
21 AAMA 2604 and AAMA 2605 Superior Performance Standard and meets EPA, OSHA, State and Local
22 environmental requirements and contains no chromates, cyanides or other heavy metals. Waste treatment is
23 usually a simple pH neutralization and disposal to the sanitary sewer.
24 B. Dulux Group Mannex base coat and Duratec Series electrostatically applied Architectural Powder Coatings
25 are approved to AAMA 2604 Performance Standard.
26 1. Gloss Level: Standard Gloss is 30 percent, plus or minus 5 percent.

27 **2.4 FABRICATION**

- 28 A. Prepare surfaces, pre-treat and coat components in accordance with AAMA 2604 and 2605 Quality
29 Standards and applicable European standards for the coating material specified.
30 B. Wrap and package coated components using methods suitable for transit and covered site storage without
31 damage.

32 **PART 3 – EXECUTION**

33 **3.1 EXAMINATION**

- 34 A. Do not begin installation until colors have been verified.
35 B. Verify framing members are ready to receive panel system.
36 C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before
37 proceeding.

38 **3.2 PREPARATION**

- 1 A. Clean surfaces thoroughly prior to installation.
- 2 B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the
- 3 material under the project conditions.

4 **3.3 INSTALLATION**

- 5 A. Install in accordance with manufacturer's installation instructions.
- 6 B. Battens and backing system to be installed in panelized sections for ease of future removal and
- 7 maintenance.
- 8 C. Fasten siding to structural supports; aligned, level, and plumb.
- 9 D. Locate joints over supports.
- 10 E. Install expansion control joints where indicated.
- 11 F. Use concealed fasteners unless otherwise approved by Architect.
- 12 G. Install components and accessories in accordance with best practice, with all joint members plumb and true.

13 **3.4 TOLERANCES**

14 **3.5 FIELD QUALITY CONTROL**

- 15 A. After installation of soffits, check entire surface for obvious flaws or defects.
- 16 B. Replace and repair any problem areas, paying close attention to the substrate for causes of the problem.

17 **3.6 CLEANING**

- 18 A. After installation of components, clean as necessary to remove all fingerprints and soiled areas.
- 19 B. Upon completion of installation, clean entire area, removing all scrap, packaging, and unused materials
- 20 related to this work.

21 **3.7 PROTECTION**

- 22 A. Protect installed products until completion of project.
- 23 B. Touch-up, repair or replace damaged products before Substantial Completion.

24
25

END OF SECTION