



SECTION 07464 (07 46 43)

COMPOSITE CLADDING AND DECKING

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**** NOTE TO SPECIFIER **** Eva-Last; Bamboo Composite Building Materials

This section is based on the products of Eva-Last, which is located at:

8560 Bellevue Drive Suite 225

Plano, TX 75024

Phone: 325-933-2701

Email: _____

Web: www.eva-last.com/us/

Over a decade ago, Eva-Last was founded by a passionate and driven team that recognized the need for environmentally conscientious, practical, and durable construction solutions. Years of research and continual product refinement have resulted in Eva-Last gaining recognition as a leader in the international composite construction industry.

CHANGING THE WAY BUILDING CAN BE DONE

Eva-Last is revolutionizing how building can be done by offering eco-friendly composite products that do the job of timber or other traditional outdoor building materials in a smarter and more sustainable way.

The Eva-Last brand is built on the principles of eco-consciousness, quality, and innovation, and our ever-growing success stands as testament to the care we put into all aspects of our business.

A BRAND YOU CAN TRUST

Eva-Last is a globally reputable brand that utilizes a solution driven business model to create innovative, sustainable building materials and systems that add value to customers' lives. At the heart of Eva-Last is a team of highly capable, creative specialists united by a passion to promote environmental consciousness through eco-friendly building products and operations. By embracing low environmental impact manufacturing and cutting-edge composite technology, Eva-Last is changing the status quo. We design and deliver beautiful, long-lasting green alternatives that make our customers' lives easier, healthier, and just plain better.

THE HASSLE-FREE ALTERNATIVE TO WOOD

Eva-Last composite offers the beauty of timber, but in a hassle-free, durable option that's longer lasting, virtually maintenance-free, and eco-friendly. Cutting-edge engineering is bringing even greater structural advancements and lifestyle benefits to composite, and thoughtful detail to aesthetics now gives it an even more natural appearance in an expanded range of products, colors, and textures.

PART 1 GENERAL

1.1 SECTION INCLUDES

**** NOTE TO SPECIFIER **** Delete items below not required for project.

- A. Composite cladding. (APEX) (INFINITY)

- B. Cladding system components.

1.2 RELATED SECTIONS

**** NOTE TO SPECIFIER ** Delete any sections below not relevant to this project; add others as required.**

- A. Section 05 40 00 - Cold-Formed Metal Framing.
- B. Section 06 10 00 - Rough Carpentry.
- C. Section 06 16 36 - Wood Panel Product Sheathing.
- D. Section 07 21 00 - Thermal Insulation.
- E. Section 07 25 00 - Weather Barriers.

1.3 REFERENCES

**** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section.**

- A. ASTM International (ASTM):
 1. ASTM D696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 and 30 degrees C with a Vitreous Silica Dilatometer.
 2. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
 3. ASTM D2017 - Standard Test Method of Accelerated Laboratory Test of Natural Decay Resistance of Woods.
 4. ASTM D2395 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials.
 5. ASTM D2565 - Standard Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications.
 6. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
 7. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials.
 8. ASTM D7031 - Standard Guide for Evaluating Mechanical and Physical Properties of Wood-Plastic Composite Products.
 9. ASTM D7032 - Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite and Plastic Lumber Deck Boards, Stair Treads, Guards, and Handrails.
 10. ASTM D7900 - Standard Test Method for Determination of Light Hydrocarbons in Stabilized Crude Oils by Gas Chromatography.
 11. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 12. ASTM G154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Materials.
 13. ASTM G155 - Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials.
- B. European Standards Organization (EN):
 1. EN 13501 - Fire Test for Building Materials.
 2. EN 15534 - Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC)).
 3. EN 13823 - Single Burning Item evaluates a building products fire properties regarding heat release rate, smoke production, flame spread and burning droplets/particles.
- C. Ford Motor Company (FORD):

1. FORD FLTM B0 162-01 – Resistance to Scratch or Marr.
- D. International Code Council (ICC):
 1. ICC-ES AC 174 - Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) - Approved January 2012, editorially revised April 2021.
- E. International Organization for Standardization (ISO):
 1. ISO 24345 - Resilient floor coverings Determination of peel resistance.
 2. ISO 868 - Plastics and ebonite Determination of indentation hardness by means of a durometer (Shore hardness).
 3. ISO 11359-1 and 2(A) - Plastics - Thermomechanical analysis (TMA) - Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature.
 4. ISO 11925 - Reaction to fire tests Ignitability of products subjected to direct impingement of flame.
 5. ISO 16869 – Plastics. Assessment of the effectiveness of fungistatic compounds in plastics formulations.
 6. ISO 9923 – Micrographics Transparent A6 microfiche.
- F. New Zealand Building Code:
 1. E2-VM1 – External Moisture Verification Method for cladding systems for buildings up to 82 ft (25 m) in height including junctions with windows, door, and other penetrations.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data:
 1. Manufacturer's data sheets on each product to be used.
 2. Preparation instructions and recommendations.
 3. Storage and handling requirements and recommendations.
 4. Typical installation methods.

**** NOTE TO SPECIFIER ** Delete if not applicable to product type.**

- C. Verification Samples: Two representative units of each type, size, pattern, and color.
- D. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

**** NOTE TO SPECIFIER ** Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.**

- D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.

1. The intent of a mock-up is to demonstrate quality of workmanship and visual appearance.
2. If the mock-up is not acceptable, rebuild the mock-up until satisfactory results are achieved.
3. Retain mock-up during construction as a standard for comparison with completed work.
4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- B. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

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

1.9 WARRANTY

- A. Manufacturer's standard limited warranty unless indicated otherwise.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Eva-Last, which is located at: 6600 Chase Oak Blvd. Suite 150, Plano, TX 75023; Phone: 325-933-2701; Email: _____; Web: www.eva.last.com/us/

**** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS

- A. Mechanical Yield: No significant yielding of any cladding system elements in any cladding scenario when subjected to a positive pressure of 1.04 psf (50 Pa).
- B. Water Ingress: E2-VM1 Verification Method employed by the New Zealand Building Regulations and Australian National Construction Code.
 1. Summary of E2-VM1 Internal test results; pressure range up to 2.09 psf (100 Pa).
 - a. Apex STTHM202: Pass.
 - b. Apex STTHM203: Pass.
 - c. Apex STTHM205: Pass.
 - d. Apex STTHM205: Pass.
 - e. Electric Box: Pass.

- f. Gutter Penetration: Pass.
- g. Horizontal Joint; Second Story Joint: Pass.
- h. Vertical Joint; Butt Joint: Pass.
- i. Window Pass: Pass.
- j. Flat Roof: Pass.
- k. Perpendicular Roof Joint: Pass.
- l. External Corner: Pass.
- m. Internal Corner: Pass.
- n. Parapet: Pass.
- o. Edges: Pass.

**** NOTE TO SPECIFIER ** Delete article if not required.**

2.3 COMPOSITE CLADDING (APEX)

**** NOTE TO SPECIFIER ** Primarily used in cladding, facades, screens, and similar applications.**

- A. Basis of Design: VistaClad Apex Profile Bamboo Foamed-PVC Cladding System as manufactured by Eva-Last. A lightweight bamboo composite cladding system with clip strip that locks boards into place using dual spring technology. Available in a range of colors and finishes, with trim and accessories, as a complete cladding system. Low-maintenance. Weather-resistant cladding. Warranty: 50 years.
- B. Cladding:
 - 1. Material: Co-extruded profiles with acrylic cap around a foamed mineral-polymer composite core.
 - a. Core:
 - 1) Poly chloroethylene (PVC): 51 percent of mass.
 - 2) Calcium carbonate: 30 percent of mass.
 - b. Cap: Acrylonitrile styrene acrylate copolymer (ASA): 10 percent of mass.
 - c. Additional Additives: 9 percent of mass.
 - 2. Material Compliance: SVHC: Pass.
 - 3. Physical Properties:
 - a. Density According to ASTM D2395: 40.58 to 46.82 lbs per cu ft (650 to 750 kg per cu m).
 - b. Moisture Content According to ASTM D4442: 0.35 percent.
 - c. Water Absorption; Mass, According to ASTM D7031-11-5.19: 1.12 percent.
 - d. Water Absorption; Dimensional, According to ASTM D1037: 0.09 percent.
 - 4. Mechanical Properties.
 - a. Material Specific:
 - 1) Abrasion Resistance, ASTM D4060: 116 mg; 1,000 cycles.
 - 2) Shore D Hardness: 82.
 - 3) Modulus of Elasticity: 36674822.6 to 43191078.1 lbs per sq ft (1,756 to 2,068 MPa).
 - b. Flexural Performance:

**** NOTE TO SPECIFIER ** Delete profile options not required.**

- 1) Profile STTHM202: Span: 15.75 inches (400 mm).
 - a) (Thickness x Width): 1 x 6.52 inches (25.4 x 165.5 mm).
 - b) Ultimate Load: 0.39 psi (2.7 kN).
 - c) Flexural Strength MOR: 632828.7 psf (30.3 MPa).
 - d) Flexural Stiffness MOE: 32706590.1 psf (1566 MPa).
- 2) Profile STTHM202: Span: 21.65 inches (550 mm).
 - a) (Thickness x Width): 1 x 6.52 inches (25.4 x 165.5 mm).
 - b) Ultimate Load: 0.25 psi (1.7 kN).
 - c) Flexural Strength MOR: 561818.2 psf (26.9 MPa).
 - d) Flexural Stiffness MOE: 36946333.2 psf (1769 MPa).

- 3) Profile STTHM203: Span: 15.75 inches (400 mm).
 - a) (Thickness x Width): 1 x 6.52 inches (25.4 x 165.5 mm).
 - b) Ultimate Load: 0.43 psi (3.0 kN).
 - c) Flexural Strength MOR: (30.8 MPa).
 - d) Flexural Stiffness MOE: (1594 MPa).
 - 4) Profile STTHM203: Span: 21.65 inches (550 mm).
 - a) (Thickness x Width): 1 x 6.52 inches (25.4 x 165.5 mm).
 - b) Ultimate Load: 0.25 psi (1.7 kN).
 - c) Flexural Strength MOR: 559729.6 psf (26.8 MPa).
 - d) Flexural Stiffness MOE: 43191078.1 psf (2068 MPa).
 - 5) Profile STTHM204: Span: 15.75 inches (400 mm).
 - a) (Thickness x Width): 1 x 6.52 inches (25.4 x 165.5 mm).
 - b) Ultimate Load: 0.42 psi (2.9 kN).
 - c) Flexural Strength MOR: 657891.2 psf (31.5 MPa).
 - d) Flexural Stiffness MOE: 32915444.4 psf (1576 MPa).
 - 6) Profile STTHM204: Span: 21.65 inches (550 mm).
 - a) (Thickness x Width): 1 x 6.52 inches (25.4 x 165.5 mm).
 - b) Ultimate Load: 0.29 psi (2.0 kN).
 - c) Flexural Strength MOR: 645359.9 psf (30.9 MPa).
 - d) Flexural Stiffness MOE: 41353159.9 psf (1980 MPa).
 - 7) Profile STTHM205: Span: 15.75 inches (400 mm).
 - a) (Thickness x Width): 1.36 x 3.43 inches (34.5 x 87.2 mm).
 - b) Ultimate Load: 0.55 psi (3.8 kN).
 - c) Flexural Strength MOR: 693396.4 psf (33.2 MPa).
 - d) Flexural Stiffness MOE: 33604663.7 psf (1609 MPa).
 - 8) Profile STTHM205: Span: 21.65 inches (550 mm).
 - a) (Thickness x Width): 1.36 x 3.43 inches (34.5 x 87.2 mm).
 - b) Ultimate Load: 0.43 psi (3.0 kN).
 - c) Flexural Strength MOR: 770672.5 psf (36.9 MPa).
 - d) Flexural Stiffness MOE: 36674822.6 psf (1756 MPa).
5. Weathering Impact on Flexural Performance: Test methods: ASTM D7032, ASTM D2565 and ASTM D7900.
 - a. High Temperature Effect:
 - 1) Flexural Strength: 18 percent.
 - 2) Flexural Stiffness: 24 percent.
 - 3) Adjustment Factor: 0.76.
 - b. Low Temperature Effect:
 - 1) Flexural Strength: -26 percent.
 - 2) Flexural Stiffness: -14 percent.
 - 3) Adjustment Factor: 1.00.
 - c. Moisture Effect:
 - 1) Flexural Strength: -3 percent.
 - 2) Flexural Stiffness: 4 percent.
 - 3) Adjustment Factor: 0.96.
 - d. UV Resistance:
 - 1) Flexural Strength: -6 percent.
 - 2) Flexural Stiffness: 1 percent.
 - 3) Adjustment Factor: 1.00.
 - e. Freeze-Thaw Resistance:
 - 1) Flexural Strength: 1 percent.
 - 2) Flexural Stiffness: 13 percent.
 - 3) Adjustment Factor: 0.97.
 - f. Overall End-Use Adjustment Factor: 0.76.
6. Thermal Expansion Coefficient, ASTM D696: 46.2 x 10e-6 mm/mm degrees C.
7. Fire Reaction Properties: Apex material tested according to ASTM E84.
 - a. Flame Spread Index: 35, Pass. Smoke Development Index: 1300.

8. Fire Reaction Properties: Apex Fire Resistant material tested according to Standard EN 13501 and tested according to EN 13823.
 - a. Fire growth rate (FIGRA) threshold 0.4 MJ: 68.7 W/s. Pass.
 - b. Total Heat Release (THR) at 600 s: 1.2 MJ.
 - c. Smoke Growth Rate (SMOGRA): 37.6 sq m per sec squared. Pass.
 - d. Total Smoke Production (TSP) at 600 s: 301.5 sq m. Requirement: Less than 200 sq m.
 - e. Droplets: Yes. Requirement: No.

**** NOTE TO SPECIFIER ** Delete color options not required.**

9. Color: Arctic birch (CG005).
 - a. Fading Properties, ASTM G155 4k Hours: Delta E: 1.3.
10. Color: Brazilian teak (CB010).
 - a. Fading Properties, ASTM G154 3k Hours: Delta E: 1.1.
11. Color: Himalayan Cedar (CL014).
 - a. Fading Properties, ASTM G154 3k Hours: Delta E: 1.72.
12. Color: Hawaiian Walnut (CB013).
 - a. Fading Properties, ASTM G154 3k Hours: Delta E: 2.26.
13. Color: Carbonised Osage.
14. Color: Alaskan Driftwood.
15. Color: Siberian Bark.
16. Color: Charred Cedar.
17. Color: Western Red Cedar.
18. Color: Grey Slate.
19. Color: Swedish Oak.
20. Color: Cloud Grey.

**** NOTE TO SPECIFIER ** Delete article if not required.**

2.4 COMPOSITE CLADDING (INFINITY)

**** NOTE TO SPECIFIER ** Primarily used in cladding, facades, screens, and similar applications.**

- A. Basis of Design: VistaClad Infinity Co-extruded capped bamboo polyethylene composite system as manufactured by Eva-Last. The composite core is wrapped in a polymer cap. A low-maintenance, eco-friendly cladding in a selection of natural finishes. Resistant to scratching, fading, moisture, insects, and weather. Warranty: 30 years.
- B. Cladding:
 1. Material: Co-extruded profiles with polymer cap around a cellulose-polymer composite core.
 - a. Cap and Core:
 - 1) Polyethylene (PE): 62 percent of mass.
 - 2) Cellulose Fibre (Bamboo fibers): 28 percent of mass.
 - 3) Calcium carbonate: 4 percent of mass.
 - b. Additional Additives: 6 percent of mass.
 2. Material Compliance: SVHC: Pass.
 3. Physical Properties: According to EN 15534.
 - a. Density: 78.03 to 81.16 lbs per cu ft (1250 to 1300 kg per cu m).
 - b. Moisture Content: 0.2 percent.
 - c. Water Absorption; Mass: 0.6 percent.
 - d. Thickness Swell, Dimensional: 0.2 percent.
 - e. Length Swell, Dimensional: 0.1 percent.
 - f. Width Swell, Dimensional: 0.0 percent.
 4. Mechanical Properties.
 - a. Material Specific:
 - 1) Scratch Resistance, FORD FLTM B0 162-01: 20 N.

- 2) Abrasion Resistance, ASTM D4060: 13 mg/c; 1,000 cycles.
- 3) Cap Delamination, ISO 24345: 60 N per 50 mm: 5.32 mm.
- 4) Shore D Hardness ISO 868: 71.
- 5) Modulus of Elasticity: 36674822.5 to 43191078 psf (1,756 to 2,068 MPa).
- 6) Brinelle Hardness, EN 15534-1: 5772.5 psi (39.8 N per sq mm).
- 7) Impact Test. Value of Residual Indentation, EN 15534-1: 0.003 inches (0.08 mm).
- 8) Maximum Crack Length, EN15534-1: No cracking.
- b. Flexural Performance:
 - 1) Profile STGJ111: Span: 11.81 inches (300 mm).
 - a) (Thickness x Width): 0.88 x 6.28 inches (22.5 x 159.5 mm).
 - b) Ultimate Load: 0.26 psi (1.8 kN).
 - c) Flexural Strength MOR: 549287 psf (26.3 MPa).7
 - d) Flexural Stiffness MOE: 42355660.6 psf (2028 MPa).
5. Weathering Impact on Flexural Performance: Test methods: ASTM D7032, ASTM D2565 and ASTM D7900.
 - a. High Temperature Effect:
 - 1) Flexural Strength: 96.8 percent.
 - 2) Flexural Stiffness: 90.3 percent.
 - 3) Adjustment Factor: 0.9.
 - b. Low Temperature Effect:
 - 1) Flexural Strength: 145.6 percent.
 - 2) Flexural Stiffness: 137.5 percent.
 - 3) Adjustment Factor: 1.00.
 - c. Moisture Effect:
 - 1) Flexural Strength: 108.3 percent.
 - 2) Flexural Stiffness: 108.5 percent.
 - 3) Adjustment Factor: 0.96.
 - d. UV Resistance:
 - 1) Flexural Strength: 92.7 percent.
 - 2) Flexural Stiffness: 94.4 percent.
 - 3) Adjustment Factor: 1.00.
 - e. Freeze-Thaw Resistance:
 - 1) Flexural Strength: 104.8 percent.
 - 2) Flexural Stiffness: 100.7 percent.
 - 3) Adjustment Factor: 1.0.
 - f. Overall End-Use Adjustment Factor: 0.9.
6. Thermal Expansion Coefficient, ISO 11359-1 and 2 (A): 45.0 x 10e-6 mm/mm degrees C.
7. Fire Reaction Properties: Apex material tested according to ASTM E84.
 - a. Flame Spread Index: 110, Pass. Smoke Development Index: 500.
8. Fire Reaction Properties: Infinity material tested according to Standard EN 13501 and tested according to EN 13823.
 - a. Fire growth rate (FIGRA) threshold 0.4 MJ: 49 W/s. Pass.
 - b. Total Heat Release (THR) at 600 s: 4.7 MJ.
 - c. Smoke Growth Rate (SMOGRA): 156 sq m per sec squared. Pass.
 - d. Total Smoke Production (TSP) at 600 s: 97 sq m. Requirement: Less than 200 sq m.
 - e. Droplets: No.
9. Color: Baltic Nero (C02). Change perceptible at a glance.
 - a. Fading Properties, ASTM G155 4k Hours: Delta E: 2.46. Grey Scale: 3 to 4.
10. Color: Caribbean coral. Change perceptible at a glance.

- a. Fading Properties, ASTM G154 3k Hours: Delta E: 2.48. Grey Scale: 3 to 4.
- 11. Fungal Resistance, ICC-ES AC 174: Test method: ASTM D2017.
 - a. Fungal Strand: G.trabeum: 0.77 percent change in mass.
 - b. Fungal Strand: P.Placenta: 0.91 percent change in mass.
 - c. Fungal Strand: T.Versicolor: 0.90 percent change in mass.
 - d. Fungal Strand: I.Lacteus: 0.91 percent change in mass.
- 12. Termite Resistance, ICC-ES AC 174: Test method: ASTM D2017.
 - a. Fungal Strand: G.trabeum: 0.77 percent change in mass.

2.5 CLADDING SYSTEM COMPONENTS

A. Cladding System Components:

- 1. Cladding Clip Strips:
 - a. Material: Z275 Galvanized Carbon Steel, 0.05 inches (1.2 mm) gauge.
 - b. Finish: Powder coated. Ferro VEDOC VP Polyester. Color: Matt black.
 - 1) Coat Thickness: 60 to 90 μ m.
 - c. Mechanical Properties:
 - 1) Yield Strength: 4803649.9 psf (230 MPa).
 - 2) Ultimate Tensile Strength: 5639067.2 to 10442717.1 psf (270 to 500 MPa).
 - 3) Modulus of Elasticity: 29007.5 ksi (200 GPa).
 - 4) Bulk Modulus: 23206 ksi (160 GPa).
 - 5) Poisson Ratio: 0.29.
 - 6) Shear Modulus: 11603 ksi (80 GPa.).
 - d. Clip Strip Configuration: Flat.
 - 1) (L x W x D): 72 x 1.57 x 0.47 inches (1831 x 40 x 12 mm).
 - a) Ventilation Gap: 0.47 inches (12 mm).
 - 2) Minimum Yield Load: 96.9 lbs (431 N). Average Yield Load: 133.8 lbs (595 N).
 - e. Clip Strip Configuration: Channel.
 - 1) (L x W x D): 72 x 1.77 x 1.34 inches (1831 x 45 x 34 mm).
 - a) Ventilation Gap: 0.92 inches (23.5 mm) or greater.
 - 2) (L x W x D): 108 x 1.77 x 1.34 inches (2745 x 45 x 34 mm).
 - a) Ventilation Gap: 0.92 inches (23.5 mm) or greater.
 - 3) Minimum Yield Load: 84.1 lbs (374 N). Average Yield Load: 96.4 lbs (429 N).
 - f. Clip Strip Configuration: Top Hat.
 - 1) (L x W x D): 72 x 3.45 x 1.42 inches (1831 x 88 x 36 mm).
 - a) Ventilation Gap: 1 inch (25.4 mm) or greater.
 - 2) (L x W x D): 108 x 3.46 x 1.42 inches (2745 x 88 x 36 mm).
 - a) Ventilation Gap: 1 inch (25.4 mm) or greater.
 - 3) Minimum Yield Load: 84.1 lbs (374 N). Average Yield Load: 96.4 lbs (429 N).
- 2. Fasteners:
 - a. Application: Timber.
 - 1) Screw Type: Waterhead: M5.5 x 45 mm.
 - 2) Screw Type: Tek Screw: M5.5 x 50 mm.
 - 3) Material: Carbon Steel, C1022, case hardened.
 - 4) Tensile: 3124.8 lbs (13.9 kN).
 - 5) Ultimate Sheer: 1888.4 lbs (8.4 kN).
 - 6) Withdrawal Resistance: 876.7 lbs (3.9 kN).

- 7) Edge Distance: Diameter x 5: 1.1 inches (28 mm).
 - 8) Minimum Spacing: Diameter x 5: 1.1 inches (28 mm).
 - 9) Minimum Substructure Material: Pine-F7 rated at 1.42 inches (36 mm) embedment.
- b. Application: Steel.
- 1) Screw Type: Waterhead: M5.5 x 22 mm.
 - 2) Screw Type: Tek Screw: M5.5 x 25 mm.
 - 3) Material: Carbon Steel, C1022, case hardened.
 - 4) Tensile: 3439.6 lbs (15.3 kN).
 - 5) Ultimate Sheer: 1978.3 lbs (8.8 kN).
 - 6) Withdrawal Resistance: Minimum substructure material.
- a) Steel Thickness of 1.2 mm: 2.2 kN.
 - b) Steel Thickness of 1.5 mm: 4.0 kN.
 - c) Steel Thickness of 1.9 mm: 5.4 kN.
 - d) Steel Thickness of 2.4 mm: 7.4 kN.
- 7) Edge Distance: Diameter x 2: 0.47 inches (12 mm).
 - 8) Minimum Spacing: Diameter x 2: 0.47 inches (12 mm).
- c. Masonry:
- a) Hilti HPS-16 PE Sleeved Anchor: M6.0 x 40 mm.
 - b) Material: Carbon Steel, Galvanized.
 - c) Tensile: 56.2 lbs (0.25 kN).
 - d) Ultimate Sheer: 78.7 lbs (0.35 kN).
 - e) Edge Distance: 1.18 inches (30 mm).
 - f) Minimum Spacing: 1.18 inches (30 mm).
- ** NOTE TO SPECIFIER ** Confirm adequate strength. Refer to Hilti TDS.**
- g) Minimum Substructure Material: Devoid of cracks and similar. 1.18 to 1.57 inches (30 to 40 mm) typical embedment depth.
 - 2) Hilti HUS3-P Concrete Screw: Carbon Steel, Galvanized. M5.0 x 40 mm.
- a) Tensile: 629.5 lbs (2.8 kN).
 - b) Ultimate Sheer: 876.7 lbs (3.9 kN).
 - c) Edge Distance: 1.38 inches (35 mm).
 - d) Minimum Spacing: 1.38 inches (35 mm).
- ** NOTE TO SPECIFIER ** Confirm adequate strength. Refer to Hilti TDS.**
- e) Minimum Structure Material: Devoid of cracks and similar. 40 mm typical embedment depth. Confirm adequate strength. Refer to Hilti TDS.
3. Nylon Adapters: Glass fiber reinforced nylon composite.
- a. Top and Bottom Adaptor: (H x W x L): 2.75 x 1.96 x 0.90 inches (70 x 50 x 23 mm).
 - b. Side Adaptor: (H x W x L): 3.74 x 1.96 x 0.90 inches (95 x 50 x 23 mm).
 - c. Internal Corner Adaptor: (H x W x L): 2.13 x 2.13 x 1.57 inches (54 x 54 x 40 mm).
 - d. External Corner Adaptor: (H x W x L): 2.79 x 2.79 x 1.57 40inches (71 x 71 x 40 mm).
4. Trim Profiles: 0.035 (0.9 mm) thick aluminum 6063-T5. Finish: Powder Coated: 60 to 80 µm.
- a. Universal: (H x W): 1.96 x 1 inches (50 x 25 mm).
 - b. T-Trim: (H x W): 1.57 x 1 inches (40 x 25 mm).
 - c. U-Trim: (H x W): 0.83 x 0.5 inches (21 x 13 mm).
 - d. Internal Corner: (H x W): 2.32 x 2 inches (59 x 51 mm).
 - e. External Corner: (H x W): 2 x 2 inches (51 x 51 mm).

5. Sealants: Application dependent.
- 1) Soudal Sillrub Colour.
 - 2) Loctite PL Heavy Duty Sealant.
 - 3) Loctite 100 percent Silicone.
 - 4) Loctite PL Roof and Flashing Sealant.
 - 5) Alcolin Alco Flex Neutral Silicone.

**** NOTE TO SPECIFIER ** Delete article if not required.**

2.6 COMPOSITE DECKING (APEX PLUS)

**** NOTE TO SPECIFIER ** Primarily used in decking, fascia, and similar applications**

- A. Basis of Design: Apex Plus Mineral Foamed-PVC and Glass Fiber Reinforced Core Decking System as manufactured by Eva-Last. Low-maintenance. More stable with less expansion and contraction. Requires basic cleaning for optimal longevity. The protective cap is a resilient acrylic polymer, offering long-term fade, scratch, and stain resistance. Decay Resistant against insects, moisture, and the elements.
- B. Decking:
1. Material: Co-extruded profiles with acrylic cap around a foamed mineral-polymer composite core.
 - a. Core:
 - 1) Poly chloroethylene (PVC): 50 percent of mass.
 - 2) Calcium carbonate: 31 percent of mass.
 - 3) Acrylonitrile styrene acrylate copolymer (ASA): 9 percent of mass.
 - 4) Glass Fiber: 1 percent of mass.
 - b. Additional Additives: 9 percent of mass.
 - c. Cap: PMMA.
 2. Physical Properties:
 - a. Density According to ASTM D2395: 40.58 to 47.45 lb per cu ft (650 to 750 kg per sq m).
 3. Profile Properties:
 - a. Profile STTHMZQ128: Grooved deck board.
 - 1) Width x Thickness: 5.71 x 0.83 inches (144.9 x 21 mm).
 - 2) Mass: 1.44 lbs per ft (2.2 kg per m).
 - b. Profile STTHMZQ102: Square edged deck board.
 - 1) Width x Thickness: 5.52 x 0.97 inches (140 x 24.4 mm).
 - 2) Mass: 1.75 lbs per ft (2.6 kg per m).
 - c. Profile STTHMZQ103: Grooved deck board.
 - 1) Width x Thickness: 5.52 x 0.95 inches (140 x 24 mm).
 - 2) Mass: 1.68 lbs per ft (2.5 kg per m).
 - d. Profile STTHMZQ116: Grooved deck board.
 - 1) Width x Thickness: 7.49 x 0.95 inches (190 x 24 mm).
 - 2) Mass: 2.36 lbs per ft (3.5 kg per m).
 - e. Profile STTHMZQ123 Square edged deck board.
 - 1) Width x Thickness: 7.49 x 0.95 inches (190 x 24 mm).
 - 2) Mass: 2.42 lbs per ft (3.6 kg per m).
 - f. Profile STTHMZQ134 Grooved deck board.
 - 1) Width x Thickness: 5.52 x 0.89 inches (140 x 22.5mm).
 - 2) Mass: 1.62 lbs per ft (2.4 kg per m).

- g. Profile STTHMZQ135 Grooved deck board.
 - 1) Width x Thickness: 7.49 x 0.89 inches (140 x 22.5mm).
 - 2) Mass: 2.22 lbs per ft (3.3 kg per m).
- h. Profile STTHMZQ136 Starter deck board
 - 1) Width x Thickness: 5.52 x 0.90 inches (140 x 22.8 mm).
 - 2) Mass: 1.68 lbs per ft (2.5 kg per m).
- i. Profile STTHMZQ137 Starter board.
 - 1) Width x Thickness: 7.49 x 0.90 inches (190 x 22.8 mm).
 - 2) Mass: 2.29 lbs per ft (3.4 kg per m).
- 4. Mechanical Properties.
 - a. Material Specific:
 - 1) Abrasion Resistance, ASTM D4060: 0.004092 oz/c (116 mg/c); 1,000 cycles.
 - 2) Shore D Hardness: 82.
 - 3) Modulus of Elasticity: 339,880 to 420,978.5 lbs per sq inch (2344 to 2 903.3 MPa).
 - b. Flexural Performance: Profile STTHMZQ103.
 - 1) Three Point Test: BS EN 15534-1.
 - a) Span: 11.81 inches (300 mm).
 - 1) Ultimate Load: 2405.36 lbf (10.7 kN).
 - 2) Modulus of Rupture: 8758 lbf / sq inch (60.4 MPa).
 - 3) Modulus of Elasticity: 420978.5 lbf / sq inch (2903.3 MPa).
 - b) Span: 15.75 inches (400 mm).
 - 1) Ultimate Load: 1910.80 lbf (8.5 kN).
 - 2) Modulus of Rupture: 9222 lbf / sq inch (63.6 MPa).
 - 3) Modulus of Elasticity: 381277.5 lbf / sq inch (2629.5 MPa).
 - c) Span: 19.69 inches (500 mm).
 - 1) Ultimate Load: 1663.52 lbf (7.4 kN).
 - 2) Modulus of Rupture: 9367 lbf / sq inch (64.6 MPa).
 - 3) Modulus of Elasticity: 391877 lbf / sq inch (2702.6 MPa).
 - 2) Four Point Test: BS EN 15534-1
 - a) Span: 11.81 inches (300 mm).
 - 1) Ultimate Load: 3866.56 lbf (17.2 kN).
 - 2) Modulus of Rupture: 9367 lbf / sq inch (64.6 MPa).
 - 3) Modulus of Elasticity: 387164.5 lbf / sq inch (2670.1 MPa).
 - b) Span: 15.75 inches (400 mm).
 - 1) Ultimate Load: 2877.44 lbf (12.8 kN).
 - 2) Modulus of Rupture: 9265.5 lbf / sq inch (63.9 MPa).
 - 3) Modulus of Elasticity: 372505.0 lbf / sq inch (2569.0 MPa).
 - c) Span: 19.69 inches (500 mm).
 - 1) Ultimate Load: 1933.28 lbf (8.6 kN).
 - 2) Modulus of Rupture: 7786.5 lbf / sq inch (53.7 MPa).
 - 3) Modulus of Elasticity: 339655.5 lbf / sq inch (2342.3 MPa).
- 5. Weathering Impact on Flexural Performance: Test methods: ASTM D7032, ASTM D2565 and ASTM D7900.
 - a. High Temperature Effect:
 - 1) Flexural Strength: 18 percent.
 - 2) Flexural Stiffness: 24 percent.
 - 3) Adjustment Factor: 0.76.
 - b. Low Temperature Effect:
 - 1) Flexural Strength: -26 percent.
 - 2) Flexural Stiffness: -14 percent.
 - 3) Adjustment Factor: 1.00.

- c. Moisture Effect:
 - 1) Flexural Strength: -3 percent.
 - 2) Flexural Stiffness: 4 percent.
 - 3) Adjustment Factor: 0.96.
- d. UV Resistance:
 - 1) Flexural Strength: -6 percent.
 - 2) Flexural Stiffness: 1 percent.
 - 3) Adjustment Factor: 1.00.
- e. Freeze-Thaw Resistance:
 - 1) Flexural Strength: 1 percent.
 - 2) Flexural Stiffness: 13 percent.
 - 3) Adjustment Factor: 0.97.
- f. Overall End-Use Adjustment Factor: 0.76.
- 6. Thermal Expansion Coefficient, ASTM D696: 35.0×10^{-6} mm/mm degrees C.
- 7. Fire Reaction Properties:
 - a. Apex Plus, EN 13501 and tested according to EN 9239 and ISO 11925: Class Efl.
 - b. Apex Single Cap, EN 13501 and tested according to EN 9239 and ISO 11925:
 - 1) Critical Heat Flux: 11 kW per sq m.
 - 2) Smoke Production: 254.0 percent minimum.
 - 3) Flame Spread (Fs): Yes.
 - 4) Class: Bfl-s1.
 - c. Apex Dual Tone, EN 13501 and tested according to EN 9239 and ISO 11925:
- 8. Fire Reaction Properties: Apex Dual Tone material tested according to ASTM E84.
 - a. Flame Spread Index: 35, Pass. Smoke Development Index: 1300.
 - 1) Smoke Production: 728.0 percent minimum.
 - 2) Flame Spread (Fs) 10 minute: 800 mm.
 - 3) Flame Spread (Fs) 20 minute: 660 mm.
 - 4) Flame Spread (Fs) 30 minute: 760 mm.
 - 5) Critical Heat Flux: 1.8 kW per sq m.
 - 6) Heat Flux (HF) 10 minutes: 3.8 kW per sq m.
 - 7) Heat Flux (HF) 20 minutes: 2.4 kW per sq m.
 - 8) Heat Flux (HF) 30 minutes: 1.8 kW per sq m.
 - 9) Maximum Light Attenuation: 92 percent.
 - 10) Class: Efl-s1.

**** NOTE TO SPECIFIER ** Delete color options not required.**

- 9. Color: Arctic birch (CG005).
 - a. Fading Properties, ASTM G155 4k Hours: Delta E: 1.3.
- 10. Color: Brazilian teak (CB010).
 - a. Fading Properties, ASTM G154 3k Hours: Delta E: 1.1.
- 11. Color: Himalayan Cedar (CL014).
 - a. Fading Properties, ASTM G154 3k Hours: Delta E: 1.72.
- 12. Color: Hawaiian Walnut (CB013).
 - a. Fading Properties, ASTM G154 3k Hours: Delta E: 2.26.
- 13. Color: Carbonised Osage.
- 14. Color: Alaskan Driftwood.
- 15. Color: Siberian Bark.
- 16. Color: Charred Cedar.
- 17. Color: Western Red Cedar.
- 18. Color: Grey Slate.
- 19. Color: Swedish Oak.
- 20. Color: Cloud Grey.
- 21. Surface Properties: Slip Resistance.
 - a. Finish: L– Lateral orientation.
 - 1) Test Method: DIN 51097: SRV: 28.1. Class: C.
 - 2) Test Method: DIN 51130: SRV: 40.1. Class: R13.

- b. Finish: L – Longitudinal orientation.
 - 1) Test Method: DIN 51097: SRV: 28.4. Class: C.
 - 2) Test Method: DIN 51130: SRV: 27.5. Class: R12.
- c. Finish: L – Longitudinal orientation.
 - 1) Test Method: AS 4586 – A: SRV: 62.0. Class: P5.
 - 2) Test Method: AS 4586 – B: SRV: 0.95. Class: D1.
 - 3) Test Method: AS 4586 – C: SRV: 34.0. Class: C.
 - 4) Test Method: AS 4586 – D: SRV: 28.4. Class: R11.
- d. Finish: L – Longitudinal orientation.
 - 1) Test Method: AS 4586 – A: SRV: 47.0. Class: P5.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until the substrates have been properly constructed and prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

3.2 PREPARATION

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

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

**** NOTE TO SPECIFIER ** Delete installation guide not required.**

- 1. VistaClad Installation Guide: Most recent version.
- 2. Apex Plus Decking Installation Guide: Most recent version.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

**** NOTE TO SPECIFIER ** Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.**

- B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.5 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturers recommendations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION