* **PART 1 GENERAL**
* **SECTION INCLUDES**
* Supply and install profiled prefinished aluminum cladding and soffit/ceilings forming a part of an exterior wall rainscreen system with girts, [insulation and air/vapour retarder,] flashings and trims using prefinished sheet materials and concealed fasteners.
* **related work [EDIT AS REQUIRED]**
* [Section 03 30 00 - Cast-In-Place Concrete]
* [Section 05 10 00 - Structural Steel Framing]
* [Section 05 41 00 - Structural Metal Stud Framing]
* [Section 06 10 00 - Rough Carpentry]
* [Section 07 21 13 - Board Insulation]
* [Section 07 25 13 - Modified Bituminous Air and Vapor Retarders]
* [Section 07 62 00 - Sheet Metal Flashing and Trim]
* [Section 07 92 00 - Joint Sealants]
* **References**
* Aluminum Association, Inc. (AAI), Current edition
* DAF-45, Designation System for Aluminum Finishes
* American Architectural Manufacturers Association (AAMA), Current editions
* AAMA 508 - Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.
* American Society for Testing and Materials International, (ASTM), Current editions
* ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
* ASTM D523 - Standard Test Method for Specular Gloss.
* ASTM D714 - Standard Test Method for Evaluating Degree of Blistering of Paints.
* ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
* ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
* ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
* ASTM D2248 - Standard Practice for Detergent Resistance of Organic Finishes.
* ASTM D2794 - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
* ASTM D3359 - Standard Test Methods for Rating Adhesion by Tape Test.
* ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test.
* ASTM D4145 - Standard Test Method for Coating Flexibility of Pre-painted Steel.
* ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
* ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
* ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750oC.
* ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
* ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
* U.S. Green Building Council (USGBC) - Current editions
* LEED V4 for Building Design and Construction.
* LEED for New Construction and Major Renovations.
* LEED for Core and Shell Development.
* **system description [EDIT AS REQUIRED]**
* Design Requirements
* General Cladding Properties:
* Fire Propagation - ASTM E84: Qualified
* Flame Spread Index – ASTM E84: 0
* Smoke Developed Index – ASTM E84: 0
* Combustibility – ASTM E136 Option A: passed
* Pressure Equalization – AAMA 508: Pass
* Static Water Penetration (15 psf) – AAMA 508: Pass
* Dynamic Water Penetration – AAMA 508: Pass
* Structural Loading – AAMA 508: Pass; Design Pressure = 80 psf
* [High Performance Fluorocarbon Finish Coating:]
* Minimum Thickness - ISO 2360: 27 micrometers
* Gloss - ASTM D523: 20-45%
* Pencil Hardness - ASTM D3363: 2H
* Toughness - ASTM D4145: 2T no rift
* Adhesive Force - ASTM D3359: 4B
* Impact Resistance - ASTM D2794: >100 kg.cm
* Abrasion Resistance - ASTM D968: 64.6 L/mil
* Humidity Resistance - ASTM D714: 3000 hrs no blister
* Boiling Water Resistance - ASTM D3359: passed
* Salt-Spray Resistance - ASTM B117: 3000 hrs no blister
* Acid Resistance - ASTM D1308: No effect
* Alkali Resistance - ASTM D1308: Passed
* Solvent Resistance - ASTM D2248: Passed
* Color Retention - ASTM D2244: Delta E = 0.34
* Chalk Resistance - ASTM D4214: No chalking
* Gloss Retention - ASTM D2244: >80 percent
* [High Performance Powder Coated Finish: Decoral System USA Corporation, passes coating performance testing in accordance with AAMA 2604.]
* Direct Inland, 45degree South-Florida, 48 month Inspection Report by Q-Lab Test Services
* Direct Inland, 45degree South-Florida, 48 month Instrumental Color Report by Q-Lab Weathering Research
* Gloss Retention - ASTM D523: 50%
* Chalking – ASTM D4214 Test Method A: 8
* Fade – ASTM D2244 : <5
* **PERFORMANCE REQUIREMENTS[EDIT AS REQUIRED]**
* Maximum deflection not to exceed L/180 under system’s own weight plus positive and negative wind loads as calculated in compliance with the authority having jurisdiction. Where deflection may be exceeded, install panel stiffeners in compliance with the manufacturer’s installation instructions.
* Design sheet cladding to span continuously over at least four structural supports (three spans) and design fastening to structural supports to withstand factored loads in accordance with authority having jurisdiction and the project structural design.
* Calculate live load deflections in accordance with authority having jurisdiction and as modified by the requirements of this Section.
* Provide for thermal dimensional movement due to thermal changes. The product should not be installed where surface temperatures are anticipated to exceed 180°F (82°C).
* Install expansion joints to accommodate movement in wall system and between wall system and building structure, where these movements are caused by deflection of building structure, and accommodate these movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.
* Provide for positive drainage to the exterior of all water entering or condensation occurring within the system.
* Final review and acceptance of work completed by this Section shall be carried out by the [Manufacturer's Representative], [the Consultant], [Contractor] and the [Subcontractor].
* **LEED CREDIT CONTRIBUTIONS[EDIT AS REQUIRED]**
* Provide required information in accordance with Section 01 33 00 – Submittal Procedures.
* Coordinate LEED project and submittal requirements with Section 01 35 11 - LEED Requirements.
* MR Credit 2[.1] [.2] – Construction Waste Management:
* Content: Reduce the amount of construction waste materials going to landfill by using more efficiently sized materials; a minimum of [50 percent] [75 percent] by weight of construction waste materials must be diverted from landfill disposal; larger plank products having fewer off cuts may contribute to the required content.
* Compliance Requirements: Submit calculations indicating reduction in waste materials by comparing amount of waste arising from using standard plank products compared to larger plank products; products that use less packaging will be given preference over products that provide standard packaging.
* Coordinate waste management requirements with
* Section 01 74 21  Construction/Demolition Waste Management and Disposal.
* Remove from site and dispose of packaging materials at appropriate recycling facilities, as follows:
* Divert unused metal materials from landfill to metal recycling facility.
* Divert unused wood materials from landfill to recycling or composting facility.
* Divert unused coating and sealant materials from landfill to official hazardous material collections site; do not dispose of unused paint and sealant materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.
* **Submittals**
* Submit product data in accordance with Section 01 33 00 – Submittals:
* Submit manufacturer's printed product literature, specifications and datasheet.
* Submit WHMIS MSDS Material Safety Data Sheets. Indicate VOC’s:
* Sealant materials during application and curing.
* Finishing materials.
* Insulation adhesives.
* Paints.
* Isolation coatings.
* LEED Submittals: Coordinate LEED submittal requirements with Section 01 35 11 - LEED Requirements.
* Product Data: Submit manufacturer's product data, standard drawing details, and installation instructions for system and individual components.
* Indicate arrangement of cladding system including dimensions, wall openings, location of joints, profiles of inner and outer skin, types and locations of supports, fasteners, flashing, closures, compliance with design criteria and requirements of related work.
* Submit samples in accordance with Section 01 33 00 – Submittals:
* Submit duplicate 300 x 300mm samples of wall system, representative of materials, finishes and colors.
* Prior to ordering materials, provide to consultant the following for verification purposes: three samples of color of finish specified.
* Color Charts: Submit cladding manufacturer’s color charts showing full range of standard colors and finishes.
* Close-out Submittals: Upon project completion, submit manufacturer’s warranties, including limitations and conditions. Coordinate LEED Close-out Submittal requirements with Section 01 35 11 - LEED Requirements.
* Warranties: Submit manufacturer’s product warranties and installer’s installation warranty.
* **Quality Assurance [EDIT AS REQUIRED]**
* Coordinate requirements with Section 01 45 00 - Quality Control.
* Test Reports: certified test reports confirming compliance with specified performance characteristics and physical properties.
* Installer Qualifications: Engage experienced installer, with a minimum of five years experience, who has completed systems similar in material, design, and extent to that indicated for Project and with record of successful performance.

Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, manufacturer’s installation instructions, and manufacturer’s warranty requirements.

* Participants: General Contractor, installation subcontractor, [Construction Manager,] [Owner,] [Consultant], [Architect,] and [Engineer].
* Review wall framing for potential interference and conflicts; coordinate layout and support provisions for interfacing work.
* Review construction schedule and confirm availability of products, installation personnel, equipment and facilities.
* Review regulatory, insurance and certification requirements.
* Review field quality control procedures.
* Mock-Ups: Mock up complete system at location as directed by [Consultant] [Architect] [Engineer].
* Construct a [portion of one exterior wall in location agreed upon by Consultant] [a free standing mockup] to establish a standard of construction, workmanship, and appearance.
* Construct mockup indicating relationship between wall cladding, air spaces, air/vapour retarder membrane, windows, and doors.
* Do not continue with work of this Section until [Construction Manager,] [Owner,] [Consultant], [Architect,] [Engineer] has approved mockup.
* [Remove freestanding mockup upon completion of all metal cladding work or when otherwise directed by Consultant].
* [Accepted mock-ups may be incorporated into the work of this Section.]
* **Delivery, Storage and Handling**
* Ordering: Conform to manufacturer’s ordering instructions and lead time requirements to avoid construction delays.
* Deliver materials and components in manufacturers’ unopened containers or bundles, fully identified by name, brand, type and grade. Prevent damage during unloading, storing and installation.
* Store, protect and handle materials and components in accordance with manufacturer’s recommendations to prevent twisting, bending, mechanical damage, contamination and deterioration.
* Store materials off ground on clean pallets and keep clean, dry, and free of dirt and other foreign matter.
* **Project/Site Conditions**
* Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work
* Undertake installation work only when weather conditions meet manufacturers’ specific environmental requirements and when conditions will permit work to be performed in accordance with manufacturer recommendations and warranty requirements.
* **WASTE MANAGEMENT AND DISPOSAL [EDIT AS REQUIRED]**
* Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.
* Divert used metal cutoffs from landfill by disposal [into the onsite metals recycling bin] [removed for disposal at the nearest metal recycling facility].
* Divert reusable materials for reuse at nearest used building materials facility.
* Divert unused sealants, and adhesive materials from landfill through disposal at hazardous material depot.
* **Warranty [EDIT AS REQUIRED]**
* Manufacturer’s Product Warranties:
* Cladding System: Fifteen Year Limited Product Warranty against physical defects of systems and products that are properly installed and maintained according to the manufacturer’s published application instruction.
* Finish Coating: Fifteen Year Limited Product Warranty against physical defects of systems and products that are properly installed and maintained according to the manufacturer’s published application instruction.
* Contractor’s Labor Warrantees: [One year] [Two year] labor warranty, starting from [date of Owner acceptance of completed work] [Substantial Performance], to cover repair of materials found to be defective as a result of installation errors.
* **PART 2 PRODUCTS**
* **2.1 Manufacturer**
* AL13® Architectural Systems, Tel: 855-438-2513, Info@AL13.com, [www.AL13.com](http://www.al13.com/).
* **2.2 Metal Siding [EDIT AS REQUIRED]**
* Formed Aluminum Cladding: Tension levelled, aluminum in accordance with ASTM B209 and ANSI H35.1 alloy designation 6063 T5 and as follows:
* Plank Sizes: 144 inch x [4 inch] [6 inch] (3658mm x [100mm] [152mm])
* Weight: 1.35 lb/ft2 (6.59 kg/m2)
* Profile: [smooth] [wood grain]
* Finish: [fluorocarbon coating per AAMA 2605] [powder coating per AAMA 2604].
* Color: [as selected by Owner from manufacturer’s standard finish guide] [custom color matched].
* Acceptable Materials:
* AL13® Plank System Siding and Soffit, as manufactured by Anenda Systems Inc.
* **2.3 Accessories [EDIT AS REQUIRED]**
* Girts: Fabricated from minimum 0.05 inch (1.27mm) thickness galvanized steel to ASTM A653, Grade 230 with Z275 coating; finish material visible after assembly of wall system to match aluminum cladding.
* Sub-Girts: Structural quality steel to ASTM A653, with Z275 zinc coating to ASTM A792, adjustable double-angle profile as indicated to accept cladding with structural attachment to building frame.
* Extrusions: 144 inch (3658mm) long, corners and caps to profile for application.
* Clips: Four inch (102mm) long system clips
* Fasteners for System Clips:
* Attachment of Clips to Steel Substrate: #12-14 x 1 ½ inch (38mm) drill-point fasteners with EPDM composite washers and corrosion-resistant coating. Installed every 32 inches (81.28cm) on center.
* Acceptable Materials:
* #12-14 x 1 ½ inch AL13® Hex-Head Fastener, coated with drill-point.
* Attachment of Clips to Wood Substrate: #12- 14 x 1 ¾ inch (44.45mm) mini drill-point fasteners with EPDM composite washers and corrosion-resistant coating. Installed every 32 inches (81.28cm) on center
* Acceptable Materials:
* #12-14 x 1 ¾ inch AL13® Hex-Head Fastener, coated with mini drill-point.
* Fastener Corrosion Resistance:
* Carbon Steel: Coated to provide not less than 1,700 hours of ASTM B 117 salt spray performance with no white or red rust; 18 cycles of ASTM G 87 (DIN 50018) SO2 Kesternich testing with not more than 15 percent red rust.
* Fasteners for Frame Components:
* Attachment of System frame components to Steel Substrate: #10-16 x ¾ inch (19.05mm) self-drilling screws with corrosion-resistant coating. Installed every 24 inches (60.96cm) on center.
* Acceptable Materials:
* #10-16 x ¾ inch AL13® Hex-Head Fastener, coated with drill-point.
* Attachment of System frame components to Wood Substrate: #12-14 x 1 ½ inch (38mm) mini drill-point fasteners with EPDM composite washers and corrosion-resistant coating. Installed every 16 inches (40.64cm) on center, unless securing a segmented (3 ¼ inch) (8.25cm) backplate (installed 16 inches (40.64cm) on center), in which case two fasteners per segmented piece are required.
* Acceptable Materials;
* #12-14 x 1 ½ inch AL13® Hex-Head Fastener, coated with mini drill-point.
* Fastener Corrosion Resistance:
* Carbon Steel: Coated to provide not less than 1,700 hours of ASTM B 117 salt spray performance with no white or red rust; 18 cycles of ASTM G 87 (DIN 50018) SO2 Kesternich testing with not more than 15 percent red rust.
* Isolation Tape: Manufacturers standard material for separating dissimilar metals from direct contact.
* Insulation Fastenings: Corrosion resistant, hot dipped galvanized bugle head screws with 1 ½ inch (38mm) diameter washer, one inch (25mm) minimum penetration into framing.
* Insulation: Rigid type [4] [3] [2] inch as specified in Section 07 21 13.
* Air/Vapour Retarder: Selfadhesive membrane as specified in Section 07 27 13.
* Sealant: as indicated in Section 07 92 00. Color of exposed sealant to match adjacent plank.
* Gaskets: formed from medium durometer Santoprene or EPDM.
* Accessories: cap flashings, drip flashings, internal corner flashings, copings and closures for head, jamb, sill and corners, of same material, thickness and finish as exterior cladding, brake formed to shape.
* Bituminous Coating: Coldapplied asphalt mastic, in accordance with CGSB 1.108, compounded for 15 mil (0.40mm) dry film thickness per coat with inert type noncorrosive compound free of asbestos fibres, sulphur components, and other deleterious impurities.
* Expansion joints: Install expansion joints as detailed in the project drawings. Joints shall allow for calculated structural movement and thermal changes of the planks.
* **2.4 FABRICATION**
* Fabricate and finish cladding, and accessories at the factory to greatest extent possible using manufacturer's standard procedures and processes and conforming to indicated profiles and with dimensional and structural requirements.
* Fabricate cladding true, plumb and square, with no oilcanning or deformity that detracts from aesthetic appearance, matching quality and installation of accepted mockup specified above.
* Apply bituminous coating or other permanent separation materials on concealed plank surfaces where cladding will be in direct contact with substrate materials that are not compatible or could result in corrosion or deterioration of either materials or finishes.
* **PART 3 EXECUTION**
* **3.1 MANUFACTURER’S INSTRUCTIONS**
* Compliance: comply with manufacturer's written recommendations or specifications, including current product technical bulletins, handling, storage and installation instructions, and datasheets.
* **3.2 PREPARATION [EDIT AS REQUIRED]**
* Installing contractor shall obtain field dimensions from job site before fabricating wall system.
* Ensure structural support is aligned, planar in acceptable condition.
* Building surfaces shall be smooth, clean and dry, and free from defects detrimental to the installation of the system. Notify [Owner’s Representative] [General Contractor] [Architect] [Consultant] of conditions not acceptable for installation of system.
* Inspect wall system and components before installation and verify that there is no shipping damage.
* Do not install damaged planks; repair or replace as required for smooth and consistent finished appearance.
* **3.3 Installation**
* Install cladding and components in accordance with manufacturer’s published installation instructions and approved shop drawings.
* Ensure continuity of building envelope air barrier and vapor retarder systems.
* Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated in the project documents and manufacturer’s standard details.
* Install outside corners, fillers and closure strips with carefully formed and profiled fabrications.
* Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
* Attach components in manner not restricting thermal and structural movement.
* Seal junctions with adjoining work with approved sealant. Install sealant in accordance with Section 07 92 00.
* Apply isolation coating or membrane to areas of contact between dissimilar metals.
* Touch-Up Painting: Inspect completed wall system and apply matching touch-up paint, as needed, to correct minor paint flaws. Replace wall system components with major paint flaws or damage.
* **3.4 CONTROL/EXPANSION JOINTS**
* Construct control and expansion joints as indicated in the project drawings.
* Use cover sheets, of brake formed profile, of same material and finish as adjacent material.
* Use mechanical fasteners to secure sheet materials.
* Assemble and secure wall system to structural frame so stresses on sealants are within manufacturers' recommended limits.
* **3.5 CONSTRUCTION**
* Installation Tolerances: Shim and align cladding system within installed tolerance of ¼ inch (6.3mm) in twenty feet (6100mm) on level, plumb, and location lines as indicated in the project drawings, and within 1/8 inch (3mm) offset of adjoining faces and of alignment of matching profiles.
* **3.6 FIELD QUALITY CONTROL**
* Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract.
* Manufacturer's field services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
* Schedule site visits to review Work at stages listed:
* After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.
* Twice during progress of Work at 25 percent and 60 percent complete.
* Upon completion of Work, after cleaning is complete.
* Submit reports to Consultant within three days of review.
* **3.7 CLEANING**
* Perform cleaning after installation to remove construction and accumulated environmental dirt.
* Wash down exposed interior and exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final cleanup. Where surface contaminants are abrasive, use a light power wash with no wiping cloths in a first pass.
* Remove excess sealant with recommended solvent. DO NOT remove sealant with blades.
* Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers from the job site.

**END OF SECTION**