Section 07 42 13 – Aluminum Plate Wall Panels

Part 1 GENERAL

1.1 SECTION INCLUDES

.1 Aluminum Plate Wall Panels

1.2 RELATED REQUIREMENTS

.1 Section 05 41 00 - Structural Metal Stud Framing

.2 Section 06 16 43 - Gypsum Sheathing

.3 Section 07 05 42 - Thermally Improved Cladding Support Systems

.4 Section 07 21 13 - Board Insulation

.5 Section 07 27 13 - Modified Bituminous Air and Vapour Barrier

.6 Section 07 62 00 - Sheet Metal Flashing and Trim

.7 Section 07 92 00 – Sealants

1.3 REFERENCES

.1 Aluminum Association, Inc. (AA)

- .1 AA 3003 - Non-Heat Treatable Aluminum Manganese Copper Alloy; 2009.
- .2 AA 5005 - Non-Heat Treatable Aluminum Magnesium Alloy; 2010
- .3 AA 6061 - Heat Treatable Aluminum Silicon Alloy; 2009
- .4 AA 6063 - Heat Treatable Aluminum Magnesium Silicon Alloy; 2009.

.2 American Architectural Manufacturers Association (AAMA)

- .1 AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2005
- .2 AAMA 508 - Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems; 2014.
- .3 AAMA 620 - Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates; 2002.
- .4 AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

.3 American Society for Testing and Materials International (ASTM)

- .1 ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011

.2 ASTM D523 - Standard Test Method for Specular Gloss; 2014
.3 ASTM D2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2015
.4 ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity; 2011
.5 ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 07(2015)
.6 ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 04(2012)
.7 ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 00(2009)
.8 ASTM E1233/E1233M – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Cyclic Air Pressure Differential; 2014 [Testing based on 2006 Edition]

.4 LEED Reference Guide for Green Building Design

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting prior to beginning work of this Section and on-site installation, with Contractor, Consultant, Panel Fabricator and Panel Installer to:

.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Coordinate with other building sub-trades.
.4 Review installation method and warranty requirements.
.5 Review field quality control procedures.

.2 Panel Fabricator’s representative shall also provide inspection visits during the course of work of this Section to assure quality and competence of panel installation.

1.5 SUBMITTALS

.1 Provide submittals in accordance with Division 01 Requirements

.2 LEED Submittals: in accordance with requirements of Section 01 35 21 - LEED Requirements; submit product information and supporting documentation for verification related to following Credits:
.1 MR Credit 4 Recycled Content.

.3 Product Data
.1 Submit aluminum plate manufacturer's printed product literature, specifications and datasheet.

.4 Shop drawings

.1 Submit shop drawings, signed and sealed by the Panel Fabricator's Engineer.
.2 Indicate layout, profiles and product components including anchorage, accessories, finish colours and textures.
.3 Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and gaskets and location and configuration of movement joints.

.5 Samples

.1 Submit duplicates of aluminum plate manufacturer's standard sized samples in specified thickness, finishes, and selected colours. Allow for review at panel fabrication facility of clips, anchors, supports, fasteners, closures, and other panel accessories for assembly approval.

.6 Panel Fabricator's Instructions

.1 Submit installation instructions
.2 Submit special handling criteria and cleaning procedures.

.7 Shop drawing submittals shall bear the seal of a professional engineer registered in the geographical jurisdiction.

.8 Submit delegated design professional engineer's design notes and calculations upon request of the Consultant.

.9 Schedules from Panel Fabricator's Engineer:

.1 Provide requisite engineering schedules from Registered Professional Engineer.

.10 Field Review Reports

.1 Provide requisite schedules by professional engineer

.11 Quality assurance submittals

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
.2 Certificates: submit certificates certifying that aluminum plate complies with specified performance characteristics and physical properties.

1.6 QUALITY ASSURANCE

.1 Aluminum Plate Manufacturer

.1 Company specializing in manufacturing products specified by this Section.
.2 Able to document minimum 10 years experience in such manufacturing.

.2 Panel Fabricator

.1 Company specializing in designing, engineering, and fabricating wall panels of this Section.
.2 Able to document minimum 10 years experience. Submit project contact information. Owner, General Contractor, Architect names and phone numbers including project addresses.
.3 Approved Panel Fabricator
.1 Keith Panel Systems Co. Ltd., www.keithpanel.com

.3 Panel Installer

.1 Company specializing in installing work of this Section.
.2 Able to document minimum 5 years experience. Submit project contact information. Owner, General Contractor, Architect names and phone numbers including project addresses.
.3 Trained and authorized by Panel Fabricator as qualified to perform work of this Section.
.4 Approved Panel Installers
.1 Keith Panel Systems Co. Ltd., www.keithpanel.com
.2 Parker Johnston Industries Ltd., www.parkerjohnstonroofing.com
.3 Sobotec Ltd., www.sobotec.com

.4 Retain a professional engineer, registered in the geographical jurisdiction of the Work, to provide structural engineering for fabrication and erection of the Work of this Section.

.5 Building Code and Contract Document requirements including, but not limited to, the following:

.1 Seal and signature to shop drawings and design submittals requiring structural engineering.
.2 Field review of installed components.

1.7 MOCK-UPS

.1 Construct in-situ mock-ups if necessary in accordance with Division 01 Requirements

.2 Cost of mock-up(s) that do not remain as part of the completed Work are separate from Sub-trade Contract Price and are to be submitted to Contractor for review and approval by Owner

.3 Construct mock-ups in locations as directed by Consultant:

.1 Provide mock-up for evaluation of surface finishes and workmanship.
.2 Construct mock-up indicating relationship between wall panels, air spaces, air/vapour retarder membrane, windows, and doors.
.3 Remove and replace units which are not accepted.
.4 Do not proceed with remaining work until workmanship, colour, and finish are reviewed by Consultant.
.5 Refinish mock-up area as required to produce acceptable work.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for this work.

.1 Approved mock-up may remain as part of finished work.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver components, aluminum plate panels, and other manufactured items so as not to be damaged or deformed. Package aluminum plate panels for protection during transportation and handling.

.2 Unload, store, and erect aluminum plate panels in a manner to prevent bending, warping, twisting, and surface damage.

.3 Stack aluminum plate panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store aluminum plate panels to ensure dryness, with positive slope for drainage of water. Do not store aluminum plate panels in contact with other materials that might cause staining, denting, or other surface damage.

.4 Retain strippable protective covering on aluminum plate panels during installation.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling and disposal in accordance with Division 01 Requirements.

1.10 WARRANTY

.1 Workmanship Warranty

.1 Installer agrees to repair or replace components of the panel system that fail in workmanship within specified warranty period. Failures include all items in relation to the following:

.1 Structural failures.

.2 Rainscreen performance failures.

.2 Warranty Period: Two years from date of Substantial Completion.

.2 Aluminum Plate Material Warranty

.1 Aluminum Plate Manufacturer's standard warranty in which Manufacturer agrees to repair finish or replace aluminum plate panels that show evidence of deterioration. Deterioration of finish includes, but is not limited to, colour fade, chalking, cracking, peeling of factory-applied finishes within specified warranty period under the following criteria:

.1 Color fading more than 5 Hunter units when tested according to ASTM D 2244.

.2 Chalking in excess of a No.8 rating when tested according to ASTM D 4214.

.3 Cracking, checking, peeling, or failure of paint to adhere to bare metal.

.2 Finish Warranty Period:
1. 20 years from date of Substantial Completion for factory line coated finishes.
2. 10 years from date of Substantial Completion for post-painted finishes.

Part 2 Products

2.1 SYSTEM DESCRIPTION

.1 Factory-formed and assembled, site installed, aluminum plate wall panels fabricated from min. 0.063" (1.5mm) aluminum plate; formed into profile for installation method indicated.

.2 Panels shall interlock with reveal joints and without exposed fasteners.

.3 System shall be of pressure-equalized Rainscreen design as tested per AAMA 508. Lag time between the cavity and cyclic wind pressure (5 PSF to 25 PSF) shall not exceed 0.08 seconds. The maximum differential between the cavity pressure and the external wind pressure shall not exceed 8%

.4 Wall panel system shall be designed for positive drainage of water intrusion and condensation to exterior of wall panel system.

2.2 PERFORMANCE/DESIGN CRITERIA

.1 Structural Performance: Provide aluminum plate panel system capable of withstanding the effects of the following loads, based on testing according to AAMA 508 and as follows:

.1 Cyclic Static Air Pressure Differential: Pass cycled pressure loading at 50 psf in 100 three-second cycles in accordance with ASTM E1233/E1233M.
.2 Air Infiltration: Pass when tested at 1.57 psf (25 mph) in accordance with ASTM E283.
.3 Water Penetration:
.1 Static: Pass water penetration test under 25.0 psf positive static air pressure difference for at least 15 minutes with 5 gallons per sf per hour of water applied in accordance with ASTM E331.
.2 Dynamic: Pass water penetration test under 15.0 psf dynamic pressure difference for at least 15 minutes with 5 gallons per sf per hour of water applied in accordance with AAMA 501.1.

.2 Thermal Movements

.1 Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

.1 Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

.3 Fire Performance

.1 Aluminum Plate Panels defined to be non-combustible in the geographical jurisdiction of the Work.

2.3 MATERIALS

.1 Aluminum Plate Material

.1 Alloy and temper as recommended by manufacturer for application.
.2 Tension-leveled, [flouropolymer PVDF painted finish, 3003-H14 manganese alloy] or [anodized finish, 5005-AQ manganese alloy].
.3 Thickness: 0.063” (1.5mm) to 0.080” (2mm) as recommended by manufacturer for application
.4 Weight: Less than 2 lbs per sf.
.5 Finish: [Two-Coat Fluoropolymer] [Three-Coat Fluoropolymer] [Four-Coat Fluoropolymer] [Two-Coat Mica Fluoropolymer].
.6 Panel Depth: 1-1/4 inch, nominal.
.7 Maximum panel size: to be reviewed with manufacturer for application and panel joint layout adjusted prior to sub-trade contract award as necessary.
.8 Panel Size: As indicated on Drawings.
.9 Panel Joints: As indicated on Drawings.
.10 Panel Reveal Width: 5/8”

.2 Panel System:

.1 Basis of Design: MODUS Rainscreen by Keith Panel Systems Co. Ltd.

2.4 SYSTEM BACK-UP MATERIALS

.1 Fasteners: Carbon steel corrosion resistant coating.

.2 Thermally broken façade substructure (if required):

.1 Attributes:
.1 Noncombustible
.2 Meet requirements of ASHRAE 90.1 for project location
.3 Adjustable for façade alignment to meet installation tolerances.
.4 Suitable for rear ventilated rain screen façade design.

.2 Acceptable product:
.1 KPS ThermaSmart Clip 3.0 by Keith Panel Systems Co. Ltd.

.3 Girts and sub-girts as detailed: custom manufactured z-girts, Galvalume steel to ASTM A792/A792M, 18 Ga. (1.2 mm) thickness, profiles as indicated, AZM 150 coating.

.4 Isolation Tape: ACM Manufacturers standard material for separating dissimilar metals from direct contact.

2.5 ACCESSORIES

.1 System Sealants: Panel system to be dry-joint Rainscreen with no reliance on surface applied sealants.

.2 Flashings: Fabricate flashing from 1.02mm (0.040”) minimum thickness aluminum sheet. Where exposed to view, finish to match adjacent panels. Provide lap strip under flashing at abutted conditions; with lapped surfaces sealed with a full-bed of non-hardening sealant.

2.6 FINISH

.1 Prefinished sheet with factory applied coating to AAMA 2605, Polyvinylidene Fluoride (PVDF) or Fluoroethylene Vinyl Ether (FEVE).

.1 Colour: to be selected by Consultant from Aluminum Plate Manufacturer’s full colour range.
.2 Custom colour(s): [to be noted here; Consultant understands that custom colours may be associated with additional set-up fees]
.3 Coating thickness: minimum two coat system not less than 30 micrometres (1.2 mils).

2.7 FABRICATION

.1 Panels and components shall comply with details as indicated on drawings and as indicated in reviewed shop drawings.

.2 Panel system shall be shop fabricated – field fabrication or assembly not acceptable.

.3 Components shall match quality and installation of accepted mock-up specified above.

2.8 EXTERIOR INSULATION

.1 Insulation: as specified in Section 07 21 13 - Board Insulation.

Part 3 Execution

3.1 PREPARATION

.1 Field verify dimensions from job site.

.2 Ensure all structural support is aligned and condition is acceptable.

.3 Building surfaces shall be smooth, clean and dry, and free from defects detrimental to the installation of the system. Notify Contractor of conditions not acceptable for installation of system.

.4 Inspect wall system and components before installation and verify that there is no shipping damage.

.5 Do not install damaged panels; repair or replace as required for smooth and consistent finished appearance.

3.2 INSTALLATION

.1 Install panels in accordance with Panel Manufacturer's written instructions and shop drawings.

.2 Ensure continuity of building envelope air barrier and vapour retarder systems.

.3 Erect panels plumb, level and true.

.4 Do not install component parts that are observed to be defective, including warped, bowed, dented, scraped and broken members.

.5 Adjust assembly to secure panels safely to wall while allowing for expansion and contraction of components.

.6 Do not cut, trim, weld, or braze component parts during erection in manner which would damage finish, decrease strength, or result in visual imperfection or failure in performance.

.7 Return component parts which require alteration to shop for fabrication, if possible, or for replacement with new parts.

.8 Ensure panels aligned vertically and horizontally.

.9 Separate dissimilar metals; use appropriate gaskets and tapes to minimize corrosive or electrolytic action between metals.

.10 Install flashings to divert all moisture and condensation to exterior. Trim and flash around doors, louvers, and windows. Use only membrane flashing supported by insulation per architectural details.

.11 Site Tolerances: Shim and align wall panel units with installed tolerances of 1/4 inch in 20 feet, non-cumulative, on level, plumb, and location lines as indicated.

.12 Touch-Up Painting: Inspect completed wall system and apply matching touch-up paint as needed to correct minor paint flaws.

3.4 CLEANING

.1 Clean in accordance with aluminum plate Manufacturer's instructions.

.2 Remove protective film from finish panels immediately once installation is complete or as otherwise directed by Consultant.

.3 Provide additional protection required after installation to protect assembly and finishes during construction.

.4 Weep holes and drainage channels shall be unobstructed and free of dirt and sealants.

.5 General Contractor to leave panels clean and free of debris and residue. Where required, clean exposed panel surfaces using non-abrasive detergent and clean water in accordance with aluminum plate Manufacturer's instructions.

End of Section__