1 PART 1 - GENERAL

1.1 SECTION INCLUDES

1.1.1 Design, labor, products, equipment and services necessary for interior/exterior Aluminum Facade System (AFS) work, in accordance with the Contract Documents.

1.2 SYSTEM DESCRIPTION

1.2.1 Work of this section to be designed by a Professional Engineer registered in state/province of location of project.
1.2.2 Design, fabricate and erect work to satisfy the requirements of this section.
1.2.3 Design system based on rainscreen principle.
1.2.4 Structural & Thermal Movements: Accommodate movement of building structure and movement caused by thermal expansion and contraction of system component parts without causing bowing, buckling, cracking, oil canning, failure of joint seals, excessive stress on fasteners or any other detrimental effects.
1.2.5 *Dead Loads:* Support self-weight of system components.
1.2.6 *Panel Removal:* Design system to allow removal of any individual panel.
1.2.7 Design panel joint system in conformance with Alumitex® AFS; any components behind the panel system should not be visible.
1.2.8 Panel joint system to be free of extruded trim returning on the face of the AFS.

1.3 QUALITY ASSURANCE

1.3.1 *Installer Qualification:* Trained and approved by the manufacturer, and having the necessary experience, staff, and training to install manufacturer's products. Manufacturer's willingness to sell its products to installers does not in itself confer qualification on installer. Provide letter of certification from manufacturer stating that installer is a certified applicator of its products, and is familiar with proper procedures and installation requirements recommended by the manufacturer. Installer shall have proven experience with exterior facade systems for a minimum of ten (10) years and to have completed at least ten (10) major wall facade projects.
1.3.2 *Pre-Installation Meeting:* Two weeks prior to commencing work of this section, arrange for the manufacturer's qualified installer to visit the site and review preparatory and installation procedures to be followed, conditions under which the work will be done, and inspect the surfaces to receive the work of this section. Consultant is responsible for scheduling the date and time of the meeting.
1.3.3 *Site Inspection:* The manufacturer’s qualified installer will inspect the site weekly if required, providing inspection reports and photographs, to verify that the work of this section is correctly installed.
1.3.4 *Source Limitations:* Obtain each type of product from a single manufacturer.
1.3.5 Panel Lines, Breaks and Angles: sharp and true.

1.4 PERFORMANCE REQUIREMENTS

1.4.1 ASTM D1781 - Standard test method for climbing drum peel for adhesives
1.4.2 ASTM E8 - Standard test method for tension testing of metallic materials
1.4.3 ASTM C297 - Standard test method for tensile strength on flat sandwich construction in flatwise plane
1.4.4 ASTM C273 - Standard test method for shear properties of sandwich core materials
1.4.5 ASTM C393 - Standard test method for flexural properties of sandwich construction
1.4.6 ASTM C518 - Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus
1.4.7 ASTM D648 - Standard test method for deflection temperature of plastics under flexural load in the edgewise position
1.4.8 ASTM D696 - Standard test method for coefficient of linear thermal expansion of plastics between –30°C and 30°C with a vitreous silica dilatometer
1.4.9 AAMA 508-07 - Standard test method for pressure equalization behavior & water penetration resistance
1.4.10 ASTM E283 - Standard test method for determining the rate of air leakage through exterior windows, curtain walls, and doors under specified pressure difference across the specimen
1.4.11 ASTM E330 - Standard test method for structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference
1.4.12 ASTM E331 - Standard test method for water penetration of exterior windows, curtain walls, and doors by uniform static air pressure difference
1.4.13 ASTM E331-00(2009) (TAS 202-94) Water Penetration by Uniform Static Air Pressure Difference

Fire Test Data (for FR)

1.4.14 NFPA 285 - Standard test method for evaluation of fire propogation characteristics of exterior non-load-bearing wall assemblies containing combustible components
1.4.15 ASTM E84 - Standard test method for surface burning
1.4.16 CAN/ULC S-134 - Standard test method for fire testing of exterior wall assemblies. (ACM FR)

1.5 SUBMITTALS

1.5.1 Submit samples in accordance with section [01 33 23]
- 1.5.1.1 [(6"-24")] [150mm-600mm] long of support framing, trims and corners.
- 1.5.1.2 [(6" or 12")] [150mm or 300mm] x [(6" or 12")] [150mm or 300mm] samples of each color selected by Consultant
- 1.5.1.3 [(6" or 12")] [150mm or 300mm] x [(6" or 12")] [150mm or 300mm] mounted samples of four equal sized panels showing four-way joint.
- 1.5.1.4 Identify samples with project number, date and name of contractor.

1.5.2 *Shop Drawings:* Bearing seal and signature of the Professional Engineer who is registered in the state/province of location of project, and who is responsible for the engineering design of work of this section. Clearly indicate finish, type and thicknesses of system components, size, spacing and location of support framing, sub-girts, connections, types and locations of fastenings. Indicate provisions for structural and thermal movement between panel system and adjacent materials.

1.6 MAINTENANCE DATA

1.6.1 Provide maintenance data for panel finishes and cleaning procedures for incorporation into manual specified in section [01 78 23 16].

1.7 PRODUCT DELIVERY, HANDLING AND STORAGE

1.7.1 Store aluminum panels and installation system materials in a dry location; handle in a manner to prevent scratching or breakage. The aluminum panels should be stored in an upright position. Panels stored in their vertical position should be on their long side. This side must be protected by means of wooden crating, cardboard or polystyrene.

1.8 MOCK-UP

1.8.1 Submit mock-up in accordance with section [01 43 39]
1.8.2 Erect mock-up of the Alumitex® AFS approximately [____] long x [____] high in location directed by Consultant.
1.8.3 Mock-up of the Alumitex® AFS shall include all components of the wall system and if approved by Consultant may be incorporated into finished work.
1.8.4 Notify 72 hours before installation of mock-up for inspection by Consultant. Do not proceed with panel system work until mock-up has been approved.

*Note: Above section to be deleted if a mock-up is not required.

1.9 COORDINATION

1.9.1 Coordinate with installers of wall mounted items, equipment, mechanical, and electrical work so that installation will not subvert the integrity of the cladding system.
1.9.2 Panel penetrations must be pre-approved by manufacturer before on-site work can commence.
1.9.3 Coordinate interface, transition, lapping, flashings and compatibility of membranes with other trades.

1.10 WARRANTY

1.10.1 For product finish, warranty from the manufacturer against staining, color fades or product deterioration shall be for a period of twenty (20) years from date of substantial completion.
1.10.2 For work in this section, warranty by manufacturer and installer against defects or deficiencies in materials or workmanship shall be for a period of one (1) year from date of substantial completion.

2 PART 2 – PRODUCTS

2.1 MANUFACTURER

2.1.1 *Specified Products:* Work of this section is based on the Alumitex® AFS, to meet this system's function, design, performance, and construction process, complying with requirements set forth in this section and subject to the consultant's acceptance.

2.1.2 All requests for equivalency to be submitted for review no later than 10 days before tender closing. No alternates will be reviewed post tender.

2.1.3 For additional information on the Alumitex® AFS please contact Ontario Panelization at david@ontariopanelizaion.com, telephone 519-659-8900

2.2 MATERIALS

Aluminum Sheet:

2.2.1 Panels shall be Alcotex® Aluminum Composite Material (ACM) – 700 Sovereign Road, London, Ontario N5V 4K7.

2.2.2 Other manufacturers are acceptable as long as they meet the same function and performance in thickness, panel weight, bond integrity, fire rating, paint color and finish. Approval shall be based on documentation submitted showing the equivalency of the material.

2.2.3 Standard Fire Resistant Core (FR)

2.2.4 *Panel Thickness:* 4mm (0.157") or (FR) 4mm (0.157")

2.2.5 *Panel Weight:* (0.157"): 1.12 lbs/ft or (FR) 4mm (0.157"): 1.54 lbs/ft²

2.2.6 *Bond Integrity:* When tested for bond integrity with the ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin or b) cohesive failure of the core itself below the following values.
Peel Strength: 115 N mm/mm (22.5 in lb/in) as manufactured 115 N mm/mm (22.5 in lb/in) after 21 days soaking in water at 70º F.

2.2.7 *Panel Finishes:* Coil coated with a Polyvinylidene fluoride (PVdF) coating containing a minimum of 70% KYNAR 500®/HYLAR 5000® resins in conformance with the following AAMA 2605 requirements.

1. *Color:* (Select one of the following)
   a) Standard color as selected by the owner/architect from manufacturer's standard colors.
   b) Custom color to be matched by the panel supplier.
2. *Coating:* Shall be factory applied on a continuous process paint line.
   a) Colors: 1.0 mil (± 0.2 mil)
   b) Clear: 0.5 mil (± 0.05 mil)
3. *Hardness:* ASTM D3363; HB minimum using Eagle Turquoise pencil.
4. *Impact:*
   a) Test Method: ASTM D2794; Gardner Variable Impact Tester with 5/8" mandrel.
   b) Coating shall withstand reverse impact of 1.5"/pounds per mil substrate thickness.
   c) Coating shall adhere to metal when subjected to #600 Scotch tape pick off test. Slight cracking permissible. No removal to substrate.

5. *Adhesion:*
   a) Test Method: ASTM D3359
   b) Coating shall not pick off when subjected to an 11" x 11" x 1/16" grid and taped with #600 Scotch tape.
6. *Humidity Resistance:*
   a) Test Method: ASTM D2247
   b) No formation of blisters when subject to condensing water fog at 100% relative humidity and 100ºF for 4000 hours.
7. *Salt Spray Resistance:*
   a) Test Method: ASTM B117; Expose coating system to 4000 hours using 5% NaCl solution
   b) Corrosion creepage from scribe line: 1/16".
   c) Minimum blister rating of 8 within the test specimen field.
8. *Weather Exposure – Outdoor:*
   a) Ten year exposure at 45º angle facing south Florida exposure.
   b) Maximum color change of 5 Delta E units as calculated in accordance with ASTM D2244.
   c) Maximum chalk rating of 8 in accordance with ASTM D4214.
   d) No checking, crazing or adhesion loss.

Unity® Attachment Technology:

2.2.8 A Concealed Mechanically Fastened Aluminum Framing System as manufactured by Elemex® Inc. that can support a variety of veneer finishes. Alumitex® ACM adjacent to Ceramitex® will seamlessly integrate and finish at the same plane.

2.2.9 *Aluminum Infill Treatment:* Alumitex® infill strip;
.1 *Color:* [To match Panel]

Related Products:

2.2.10 *Supporting Framing:* Load bearing, thermal break clip, manufactured from [Z-275] galvanized steel with a bonded thermal retardant membrane. Adjustable angles, Z-bars and channel subgirts: manufactured from [Z-275] galvanized steel and shall be designed to accommodate expansion and contraction, dynamic movements and design load requirements.

2.2.11 *Air/Vapor Barrier:* Use approved material as required by local building code.

2.2.12 *Semi-rigid, Rigid, Sprayed Insulation:*
.1 Use approved insulation material conforming to local building codes.
.2 Thickness: [_____]
.3 Acceptable Material:
.1 [_____]

2.2.13 *Trims and Closures:* Inside corners, outside corners, control joints, wall fixtures and termination trims. Painted steel.

2.3 FABRICATION

2.3.1 Co-ordinate and verify job site dimensions affecting work of this section. Ensure suitability of adjacent building components in relation to work of this section.

2.3.2 Aluminum Sheets to be fabricated with a CNC router table to ensure cutting accuracy and smooth edge quality. Fabricate sheets square to difference of diagonal measurements of not more than 0.2%.

For questions or concerns, please contact David Waugh at Ontario Panelization: david@ontariopanelization.com, telephone 519-659-8900

2.3.3 Panels to be factory fabricated in a controlled environment.
2.3.4 Fabricate work to profiles and sizes as indicated on the architectural drawings and confirmed site dimensions, as defined in this section's scope of work; complete with trims, flashings and filler components as required to interface with work of other sections. Make provisions for thermal and structural movements.
2.3.5 The location and sizes of all penetrations to be provided by all trades to the manufacturer prior to shop drawings for architect's approval. Any additional required penetrations after first submittals will be an expense to that trade. Exterior penetrations greater than 12" x 12" (300mm x 300mm) to be reinforced to details as indicated or to the manufacturer's standard.

3 PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Examine work of other sections upon which work of this section depends.
3.1.2 Report any unsatisfactory conditions to consultant in writing. Do not start work until unsatisfactory conditions are rectified.

3.2 INSTALLATION – GENERAL

3.2.1 Install supporting framing required to support work of this section.
3.2.2 Install work in accordance with manufacturer's written instructions, plumb with intersecting parts joined together to provide accurately fitted joints with adjoining surfaces in true planes. Attach components in manner not restricting movement.
3.2.3 Apply isolation coating/tape to concealed surfaces of dissimilar metals and metals in direct contact with concrete or masonry.
3.2.4 *Installer Qualification:* Trained and approved by the manufacturer as per 1.3.1.

3.3 INSTALLATION

3.3.1 *Complete Installation:* Provide mounting hardware compatible with the Alumitex® AFS, manufacturer's standard profiles, joint closures and perimeter trim as required for a complete installation.
3.3.2 When thermal break is required and/or desired, attach thermal clip to the given substrate with the appropriate fasteners as per type of the substrate. Confirm spacing and type of fastener with local Engineers to determine the appropriate attachment method.
3.3.3 Mechanically fasten sub-girts to thermal clip; following manufacturer's installation guidelines.
3.3.4 Align Alumitex® panels end-to-end to provide accurate fit with adjacent panels. Ensure adjacent panels are parallel and straight at joints.

3.4 INSTALLATION TOLERANCES

3.4.1 *Variation in Line Over Entire Area*: For positions shown in plan and continuous lines, do not exceed 1:500 or 15 mm, whichever is less.

3.4.2 *Variation in Plumb Over Entire Area:* Vertical lines, external corners and other vertical conspicuous lines, do not exceed 1:500.

3.4.3 *Variation in Level, Panel to Panel*: Horizontal bands, horizontal grooves, and other horizontal conspicuous lines, do not exceed 1:500.

3.4.4 *Variation in Panel Joint Width:* Do not exceed 3 mm.

3.4.5 *Variation in Plane Between Adjacent Panels (Lipping or Step-in-Face):* Do not exceed 1 mm difference between planes of adjacent panels.

3.4.6 *Jog in Alignment of Edge of Adjacent Panels:* Do not exceed 1 mm.

3.5 CLEAN-UP

3.5.1 Clean exposed panel surfaces in accordance with manufacturer's instructions.

END OF SECTION