PART 1 - GENERAL

1.01 Summary

A. Section Includes
1. The extent of panel system work is indicated on the drawings and in these specifications.
2. Panel system requirements include the following components:
   a. Aluminum faced composite panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, sealants, related flashing adapters and masking (as required) for a complete installation.
   b. Furnish and install all aluminum faced composite building panels, including moldings, fasteners, flashings, sealants and accessories, as shown on the drawings and specified herein, or as required to complete the work.
   c. System to be fabricated and installed per local code requirements.

B. Related Documents

Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and Technical Specification Divisions 2 through 16 apply to this Section.

C. Related Work Specified Elsewhere
1. Section 05100: Structural Steel
2. Section 06100: Back up walls
3. Section 07200: Insulation
4. Section 07600: Metal flashing, counter flashing and parapet coping
5. Section 07920: Caulking and sealants
6. Section 09200: Interior wall finishes

1.02 Quality Assurance

1. Composite panel manufacturer shall have a minimum of 15 years experience in the manufacturing of this product.
2. Composite panel manufacturer shall be solely responsible for panel manufacture and application of the finish.
3. Fabricator shall be acceptable to composite panel manufacturer.
4. Fabricator and installer shall have a minimum of 5 years experience in architectural metal panel work similar in scope and size to this project.
5. Field measurements should be taken prior to the completion of shop fabrication whenever possible. Coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work. Field fabrication may be allowed to ensure proper fit but field fabrication should be kept to an absolute minimum with the majority of fabrication done under controlled shop conditions.
6. Shop drawings shall show the preferred joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on the inside face of the panel as determined by ASTM E331.
7. Maximum deviation from vertical and horizontal alignment of erected panels: 6mm (1/4”) in 6m (20’) non-accumulative.
8. Panel fabricator and installer shall assume undivided responsibility for all components of the exterior panel system including but not limited to attachment sub-construction, panel to panel joinery, panel to dissimilar material joinery and joint seal associated with the panel system.
9. Composite panel manufacturer shall be ISO 9001 certified

1.03 References

A. American Architectural Manufacturers Association
   1. AAMA 2605 - 98: Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
   2. AAMA 508 - 07: Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems

B. American Society for Testing and Materials
   1. E330 Structural Performance of Exterior Windows, Curtain Walls and Doors under the influence of Wind Loads
   2. E283 Rate of Leakage through Exterior Windows, Curtain Walls and Doors
   3. E331 Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Difference
   4. D1781 Climbing Drum Peel Test for Adhesives
   5. E84 Surface Burning Characteristics of Building Materials
   6. D3363 Method for Film Hardness by Pencil Test
   7. D2794 Resistance of Organic Coatings to the Effects of Rapid Deformation(Impact)
   8. D3359 Method for Measuring Adhesion by Tape Test
   9. D2247 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
   10. B117 Method of Salt Spray (Fog) Testing
   11. D822 Practice for Testing Water Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer and Related Products
   12. D1308 Effect of Household Chemicals on Clear and Pigment Organic Finishes
   13. D1735 Method for Water Fog Testing of Organic Coatings
   14. D1929 Standard Test Method for Determining Ignition Temperatures of Plastics
   15. D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

C. International Organization For Standards (ISO)
   1. ISO 9001:2000 Quality Management Systems

D. National Fire Protection Association
   1. NFPA 285: Intermediate Scale Multi Story Test

E. National Building Code of Canada 2005 (NBC)
   1. CAN/ULC S134-92 Standard Method of Fire Test of Exterior Wall Assemblies
   2. CAN/ULC S102-07 Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.04 Submittals

A. Submittals shall be in conformance with section _____

B. Samples
   1. Panel assembly: Two samples of each assembly, 304 mm (12”) x 304 mm (12”) minimum.
   2. Two samples of each color or finish selected, 76 mm (3”) x 102 mm (4”) minimum.
   3. Custom color samples will contain drawdown lines with the available sizes limited.

C. Shop Drawings: Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.

D. Manufacturer’s literature shall certify that material meets specifications

E. Documents showing product compliance with the local building code shall be submitted prior to the bid. These documents may include test reports, supporting document and drawings, and manufacturer’s data.

F. Alternate material must be approved by the Architect prior to the bid date.

1.05 Warranty

A. The fabricator and installer will warrant the system for a period of 1 year that the fabrication and workmanship will remain free from defects.

B. The aluminum composite manufacturer shall warrant the finish for a period of [Specify number of years] commencing on the date the material is ordered.

1.06 Delivery, Storage and Handling

A. Follow manufacturer's recommendations

B. Store material in accordance with panel manufacturer's recommendations.

PART 2 – PRODUCTS

2.01 Panels

A. Composite Panels
1. Panels shall be Alcotex®/FR (Fire Resistant) Aluminum Composite Material (ACM) – 700 Sovereign Road, London, Ontario N5V 4K7. Contact Alcotex, Inc. directly at 877 (Alcotex) 252-6839 or 519-455-0001, sales@alcotex.com, or www.alcotex.com.
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.

B. Fire Resistant Core (FR)

C. Panel Thickness: 4mm (0.157")

D. Panel Weight: 4mm (0.157"): 1.54 lbs/ft²

E. Product Performance
1. 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.
2. 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
3. Fire Performance
a) ASTM E84 - Passed Class A
Flame Spread Index must be less than 25. Smoke Developed Index must be less than 450.
b) NFPA 285 – Panels shall meet requirements of the Intermediate Multi Story Test
c) CAN/ULC S134-92 – Panels shall meet the Standard Method of Fire Test of Exterior Wall Assemblies
d) CAN/ULC S102-07 Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

F. 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% NaCI 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.

2.02 Panel Fabrication

A. Alcotex/FR aluminum composite material is comprised of two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process using no glues or adhesives between dissimilar materials. The core shall be free of voids and/or air spaces and not contain foamed insulation materials. The bond between the core and skins shall be a chemical bond. Products laminated sheet by sheet in a batch process shall not be acceptable.

B. Aluminum Face Sheets
   1. Thickness: 0.50mm (0.020”)
   2. Aluminum alloy shall be 3000 series or equivalent

C. Tolerances
   1. Panel Bow: Shall not exceed 0.5% of panel overall dimension in width or length
   2. Panel Dimensions: Field fabrication shall be allowed where necessary but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible. Panel dimensions shall be such that there will be an allowance for field adjustment and thermal movement.
   3. Panel lines, breaks, angles and curves shall be sharp, true and surfaces free of warps and buckles.
   4. Maximum deviation from panel flatness shall be 1/8” in 5’0” on panel in any direction for assembled unites. (Non-accumulative – No oil canning)
   5. Panel surfaces shall be free of scratches or marks caused during fabrication

D. System Characteristics
   1. Plans, elevations, details, characteristics and other requirements are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable provided their details and characteristics comply with size and profile requirements and material/performance standards.
   2. System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
   3. Fabricate panel system to dimension, size and profile indicated on the drawings based on a design temperature of 68ºF (20ºC).
   4. Design and fabricate panels to avoid compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature changes.
   5. The finish side of the panel shall have a removable protective film applied prior to fabrication which shall remain on the panel during fabrication, shipping and erection to protect the surface from damage.

E. System Type *(select from one of the following)*
   1. System I – Wet Joint: System must provide a wet seal (caulked) reveal joint as detailed on drawings. The sealant shall be specified in Section 07900 and with foamed type backer rod as indicated on architectural drawings.
   2. System III - Dry Joint: System must provide a perimeter extrusion as detailed on architectural drawings with no field sealant required in joints unless specifically noted on drawings.

F. System Performance

1. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Architect and/or local building code.

a. Wind Load – If system tests are not available, under the direction of an independent third party laboratory, mock-ups shall be constructed and tests performed to show compliance to the following minimum standards:

i. Panels shall be designed to withstand the design wind load based upon the local building code but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E330 to obtain the following results.

ii. Normal to the plane of the wall between supports, deflection of the secured perimeter framing members shall not exceed L/175 or 3/4" whichever is less

iii. Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span

iv. Maximum anchor deflection shall not exceed 1/16". At 1 1/2 times design pressure, permanent deflections of framing members shall not exceed 1/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".

b. Air/Water System Test – Without backup waterproof membrane. If system tests are not available, under the direction of an independent third party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:

i. Air Infiltration – When tested in accordance with the ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cubic feet per minute per square foot of wall area.
Water Infiltration – Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant (i.e., Dry Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.

c. AAMA 508 – 07 Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems. If system tests are not available, under the direction of an independent third party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:

i. Pressure Equalization Behavior – Pressure differential on rain screen cladding shall not exceed 50% of maximum wind gust pressure.

ii. Water Penetration Resistance – All water that penetrates the exterior rain screen cladding shall be controlled and drained to the exterior. All water that contacts the air/water barrier shall be visually observed and recorded. Water mist or water droplets appearing on the air/water barrier surface must not exceed 5% nor should there be any continuous streaming at any location on the air/water barrier after 15 minutes

2.03 Accessories

A. Extrusions, formed members, sheet and plate shall conform to ASTM B209 and the recommendations of the manufacturer.

B. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.

C. Sealants and gaskets within the panel system shall be as per the manufacturer's standards to performance requirements.

D. Fabricate flashing materials from aluminum sheet material painted to match the adjacent curtain wall/panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bead of non-hardening sealant.

E. Fasteners (concealed/exposed/non-corrosive): Fasteners are recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

PART 3 - EXECUTION

3.01 Inspection

A. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.

B. Surfaces to receive panels should be structurally sound as determined by a registered Architect/Engineer. In no case shall metal structural supports be less than 18 gauge.

3.02 Installation

A. Erect panels plumb, level, and true

B. Attachment system shall allow for free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a temperature range from -20ºF to +180º. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly, and erection shall account for the ambient temperature at the time of the respective operation.

C. Panels shall be erected in accordance with an approved set of shop drawings.

D. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.

E. Conform to panel fabricator's instructions for installation of concealed fasteners.

F. Do not install panels that are observed to be defective, including warped, bowed, dented, scraped or damaged in any manner.

G. Do not cut, trim, weld or scrape component parts during erection in a manner that would damage finish, decrease strength, or result in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.

H. Separate dissimilar metals and use appropriate gaskets and fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

3.03 Adjustment and Cleaning

A. Remove and replace panels damaged beyond repair as a direct result of panel installation. After installation, panel repair and replacement shall become the responsibility of the general contractor.

B. Repair panels with minor damage.

C. Remove masking film as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation shall become the responsibility of the general contractor.

D. Any additional protection, after installation, shall be the responsibility of the general contractor.

E. Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants.

F. Final cleaning shall not be part of the work of this section.

End of Section 07420 – (11-23-2010)