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SECTION 07460

GLASS FIBER CONCRETE PANEL RAINSCREEN CLADDING SYSTEM

PART 1 –GENERAL

1.1 SUMMARY

- A. Work Included: The Work of this Section shall include but not be limited to the following:
1. Aluminum support system
 2. Extruded Glass Fiber Concrete Panels
 3. Flashing, weather-seals, cover plates and formed metal trim
 4. Miscellaneous anchors, fasteners, adhesives, insulation, vapor barrier, sealants, and related accessories.
- B. Related Sections:
1. Section 03300 – Cast in place concrete
 2. Section 05120 – Structural Steel
 3. Section 05500 – Metal fabrications
 4. Section 06100 – Rough Carpentry
 5. Section 07200 – Building Insulation
 6. Section 07600 – Flashing and Sheet Metal
 7. Section 07841 – Fire Stop Systems
 8. Section 07270 – Air Barriers: Self Adhered Sheet Air and Water Barrier
 9. Section 07900 – Joint Sealers
 10. Section 08925 – Glazed Aluminum Curtain Walls and Sloped Glazing

1.1 DEFINITIONS

- A. Rainscreen principle: Method for controlling rain penetration through wall cladding system. Open joints allow air pressure in cavity behind cladding to equal outside air pressure thus resisting wind driven rain. Rainscreen system includes:
1. Drained and vented wall cladding.

2. Air barrier on cladding substrate (as provided for in waterproofing specification SECTION 07270 Air Barriers).
3. Subdivision of cavity behind cladding into sealed compartments.
4. Flashings and weep holes to drain water from cavity.

1.2 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Design and install Fibre Concrete Cladding and attachment system to provide in conjunction with wall substrate and air barrier a weather tight wall assembly utilizing rain screen principle.
 1. **SYSTEM DESIGN** - System design shall be responsibility of cladding supplier. Products provided must conform with design intent shown.
 - a. **PANEL SYSTEM: Rear Ventilated Rain screen Design.** System shall drain water and condensation to exterior. A complete pre-engineered system including but not limited to Glass Fibre Concrete cladding, aluminum metal support structure, closure pieces, trim and flashing. Wall panels shall be removable. Fasteners are exposed. The panels shall be secured to an aluminum metal support structure which secures to cold-formed metal framing. Spacing of cold formed metal framing indicated on structural drawings shall not be greater than 16 inch OC. Aluminum metal support structure shall also be of multiple components, with one component attaching to structure over the air barrier (using an attachment bracket) and one component fastening to bracket horizontally to allow for attachment of composite wood panels. Membrane should be visually inspected for breaches (and repaired as recommended by membrane manufacturer) prior to installation of support system.
 - b. **JOINTS:** shall be dry and un-caulked
 - c. **METAL FLASHING:** provide metal flashing for a proper water managed assembly, to direct condensation and water infiltration within the wall to weeping points. Coordinate details and installation with Air and Water Barrier provided with Section 07270. All flashing and ventilation profiles shall be provided by installer per manufacturer's recommendations (sizes and locations).
 1. Drainage flashing is the primary component of a water managed system which diverts water that has penetrated the exterior cladding away from the cladding compartment or condensation that occurs at the interior face of cladding surface
 2. Provide metal drainage flashing at locations listed below prior to installation of membrane to assure proper water drainage. Membrane shall assure proper

lap over flashing:

- a. At Bottom of System
 - b. At penetrations: Windows, Doors, Louvers, etc.
 - c. At Floor line or other locations which accommodate vertical movement
 - d. End Dams: provide shop-formed end dams where drainage flashing terminates at openings.
 - i. Configuration shall be triangular shaped, full width of horizontal flashing leg x 1 inch high.
 - ii. Attachment – solder joints and miters for an air and water tight condition.
- d. Design Modifications – shall be provided only as necessary to satisfy as built conditions and to meet performance requirements. Significant system and aesthetic design shall be requested in writing to architect 10 days prior to bid date.
2. Contractor shall be responsible for engineering system per architectural design criteria and performance requirements.

1.2 PERFORMANCE REQUIREMENTS

- A. Withstand design loads [as required by applicable codes for Project location.] [as follows:
1. Maximum panel deflection: 1/360 of span or less of span when tested in accordance with positive and negative pressures and as required to prevent cracking or damage to panel facing.
 2. Comply with applicable seismic requirements for Project location in Seismic Zone [0] [1] [2A] [2B] [3] [4] as defined by International Conference of Building Officials (ICBO)/Uniform Building Code (UBC).
 3. System shall have a design load of positive and negative pressures up to 40psf in accordance with ASTM E330.
- B. Accommodate movement of cladding components without undue stress on fasteners or other detrimental effects, when subjected to seasonal temperature range of:
1. Ambient: [120 degrees F] [67 degrees C].
 2. Cladding surface: [180 degrees F] [100 degrees C].
- C. Accommodate tolerances of support structure.
- D. Condensation: System shall accommodate positive drainage for moisture entering or condensation occurring within panel system.

11. Design drainage system for 100 year rain cycle
- E. Flatness: System shall be flat with no noticeable warpage, buckling, deflections or other surface irregularities

1.4 SUBMITTALS

- A. Provide in accordance with Section 01330 - Submittal Procedures:
 1. Product data describing materials and fabrication for Glass Fiber Concrete Panels
 2. Product data describing materials and fabrication for Aluminum Attachment System and components.
 3. Shop drawings showing:
 - a. Layout, profiles and dimensions for panels, product components, edge conditions, special shapes, and trim pieces.
 - b. Installation details: Attachment methods, fasteners, joints, corners, openings, intersections with adjacent materials, flashings, closures, trim, and other critical conditions.
 - c. Layout of Glass Fiber Concrete Panels on wall and locations of special pieces and trim.
 4. Structural calculations signed and sealed by a professional engineer registered in the State of _____.
 5. Samples (3 sets each):
 - a. 2 x 4 inch minimum color samples for review by Architect.
 - b. 4 inches minimum length of attachment profile.
 - c. typical attachment brackets and anchors
 - d. typical exposed fasteners (painted to match concrete panel)
 6. Manufacturer's installation and maintenance instructions.

1.5 QUALITY ASSURANCE

- A. System Manufacturer's Qualifications: Provide exterior wall system manufactured by a firm experienced in manufacturing systems that are similar to those indicated for this project and have a record of successful in-service performance.
- B. Installer qualifications: Company experienced in installing exterior wall cladding systems and acceptable to Glass Fiber Concrete Panel and Aluminum Support System suppliers.

- C. Prior to installation of cladding, membrane suppliers field representative shall inspect wall substrate and air barrier to confirm proper installation and submit a report of observations and findings to the Architect.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Prior to shipping, pack and crate Glass Fiber Concrete Panel System components to prevent damage during transit and storage. During transport, handle the panels with special care taken not to damage the edges of the sheets.
- B. Inspect Fiber Concrete Cladding Panels and Aluminum Attachment components immediately upon delivery at site. Notify manufacturer of damage prior to installation of materials.
- C. Follow manufacturer's instructions for storage of Glass Fiber Concrete Panels. Keep pieces in original packing material until ready to install.
- D. Do not store exterior wall system components in contact with other materials that might cause staining, denting, surface damage, or other deleterious effects.

1.7 WARRANTY

- a. Warrant the material of this section for a period of 10 years from the date of substantial completion against defects in material.
- b. Warrant the workmanship for this Section for a period of 2 years from the date of substantial completion against defects in the workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, manufacturer of exterior wall system for Glass Fiber Concrete Cladding Rainscreen system is:

Basis of Cladding Design:

[fibre C] Glass Fibre Concrete Skin

Manufactured by Reider *Smart Elements* www.rieder.cc

Distributed in Canada by:

Sound Solutions (1997), Inc

6817 Steeles Avenue West, Toronto, ON

1-800-667-2776, 416-740-0303

www.soundsolutions.ca

2.2 MATERIALS

A. [fibre C] extruded, fibre reinforced concrete panel

2. Panels: Glass fibre concrete panels made from pure mineral raw materials, (sand cement, water). Reinforced through AR(alkali-resistant) glass fibres as continuous linear glass fibre strands and short fibres in matrix.

Specifier note: Delete all but one of the following colour and surface r options:

1. Colour selected from manufacturers full range of colours

OR

2. Custom colour to match architects approved sample

Surface types

Select from the following:

MA – Matt surface

FE – ferro / sand blasted surface

FL ferrolight /sand blasted surface

Surface treatment:

A – Natural

B – Hydrophobic

C - Oiled

D - Treatment ADL

Specifier note: Delete all but one of the following panel dimensions. Custom sizes available on request. 8mm OR 13mm thickness panels are only t

8mm thickness – Available maximum size – 1200mm x 2500

13mm thickness – Available - 1200mm x 2500

1200 x 3600mm

Special 1200 x up to 5000mm

1. Dimensional Tolerances: Length +/- 2mm, Width +/- 2mm, Thickness +/- 1mm
- B. Aluminum Support Structure - Exposed Fastener System For Steel Stud Construction (or Concealed Fastener System in RED):**
1. Horizontally oriented exposed fastener attachment system (or Concealed fastener system using Keil fasteners) as recommended by Reider.
 2. Support Bracket – Angle Bracket anchored directly through wall substrate into support framing.
 3. Horizontal L Profile (or Vertical L Profile for Concealed Fastener System) – shelf shimming extrusions that fastens into open end of support bracket and supports
 4. Vertical Support rails: Aluminum U and Z shaped rails attached to L Profile which provide means to suspend Glass Fiber Concrete Panels. Exposed fasteners attach directly to vertical support rail (delete if concealed fastener system)
 5. Horizontal support rail and panel clips for Concealed Fastener System. Horizontal rails attach directly to L profile. Panel clips attach to fibreC with Keil expansion anchors – then hang on horizontal rail. Adjustments of panels are accommodated through adjustable screw elements integral to panel clips.
 6. Fasteners: Corrosion resistant fasteners and anchors of type, size, and spacing required for type of substrate and Project conditions, to meet performance requirements specified in Paragraph [1.4], and as indicated in design calculations. Keil fasteners shall be proper size and diameter for design loads.
- C. Sheet metal: Provide sheet metal flashings and trim as required for cladding system in accordance with Section 07600 - Flashing and Sheet Metal.**
1. Shop form components to profiles, dimensions, and thicknesses indicated on Drawings. Items to be provided include:
 - a. Cavity drainage flashings: Aluminum flashing at bottom of air cavities and pressurized compartments to gravity drain water from cavity.
 - b. flashing joint profiles at horizontal joint conditions Formed profiles fabricated and installed to shed water within horizontal joint condition (non-continuous, interrupted at vertical U profile).
 - c. [Window sills] [parapet caps] [transition pieces to adjacent materials] and other exposed trim: Aluminum fabrications with mill aluminum finish. Attach with clips or other means to avoid exposed fasteners.

2. Form sheet metal fabrications in longest possible lengths. Turn back all exposed edges to form hem. Fabricate vertical faces with bottom edge formed outward and hemmed to provide drip.

PART 3 - EXECUTION**3.1 INSPECTION**

- A. Examine walls to receive cladding system. Ensure substrate is structurally sound, clean, and free of contaminants which inhibit bond of air barrier.
 - 1. Maximum substrate deflection: $L/360$ or as recommended by Cladding Systems Manufacturers.
 - 2. Maximum substrate surface variation: 1/8 inch in 10 feet
 - 3. Stud construction with [gypsum sheathing] [cementitious backer board] [exterior grade plywood]: Verify stud framing is adequately braced without deflection and sheathing is properly secured with edges over firm bearing. Ensure proper framing and supports are provided and located for secure attachment of support rails.
- B. Do not proceed with cladding installation until deficiencies have been addressed.

3.2 PREPARATION

- A. Install assembly of thermal insulation, furring, and sheathing as specified in Section 07210 - Building Insulation and detailed on Drawings and approved shop drawings.
- B. Air barrier: Install air barrier to wall sheathing as specified in Section 07270 - Air Barriers and detailed on Drawings and approved shop drawings. Install horizontally starting at bottom of wall. Do not leave air barrier membrane exposed for lengthy period of time. Exercise care not to puncture or tear barrier with subsequent cladding operations.
- C. Flashings: Install sheet metal flashings, pressure compartment dividers, and trim as specified in Section 07600 - Flashing and Sheet Metal and as positioned and detailed on Drawings and approved shop drawings. Ensure flashings at bottom of wall and pressure compartments properly drain water from air cavity to exterior through weep holes. Turn up flashings 4 inches minimum and seal to substrate. Lap flashing end joints 6 inches and seal watertight.

3.3 CLADDING INSTALLATION

- A. Install cladding in accordance with manufacturer's instructions and approved shop drawings.
- B. Establish level lines for panel coursing and positioning of support rails.

- C. Support rails: Attach horizontal rails with engineered fasteners and anchors to accomplish performance requirements specified in Paragraph [1.3].
 - 1. Attach rails to substrate at 24 inches or at a distance as recommended by system suppliers in accordance with lateral loads and system dead load requirements.
 - 2. Provide 1 to 2 inches of space between ends of adjacent rails for expansion and contraction of aluminum.

- D. Glass Fiber Concrete Panels: Starting at bottom of wall, fasten panels by fastening into vertical aluminum profile at location of predrilled holes in glass fiber concrete panels
 - 1. Layout work so as to avoid or minimize cuts. Site cut composite wood panels using power saw with appropriate blade type to prevent broken corners, edges, and chips.
 - 2. Stack Bond Joint Pattern - Install panels with continuous vertical and horizontal joints (unless otherwise noted on drawings).. Vertical and horizontal joints shall be open approximately 3/16 inch [5 mm] wide.
 - 3. Tolerances: Shim and align composite wood panels to provide these tolerances:
 - a. Deviations form level or plumb alignment: 1/4 inch in 20 feet maximum, non accumulative.

3.4 CLEANING AND PROTECTION

- A. Remove and replace broken, chipped, stained, or otherwise damaged panels.
- B. Immediately after installing, wipe down work. Do not use wire brushes, metallic tools, or abrasives for cleaning.
- C. Protect cladding from roof run-off, splashed water, mud, sealants, bitumen, and other contaminants from remaining construction activities.
- D. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

END OF SECTION 7460