

SECTION 074233 – EXTERIOR SOLID PHENOLIC RAINSCREEN PANELS

PART 1 - GENERAL

1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

2 SUMMARY

A. Section Includes:

- 1. Exterior solid phenolic rainscreen wall panels and aluminum supporting substructure which is part of the rainscreen system.

B. Related Sections:

- 1. Division 07 “Fluid Applied Membrane Air Barriers “and/or “Vapor Barriers” for rain and air resistant barrier, which is an integral part of rainscreen design.
- 2. Division 07 -”Thermal Insulation”
- 3. Division 09 "Gypsum Sheathing" for exterior rainscreen wall system substrate materials and installation.
- 4. Division 06 “Rough Carpentry” or Division 05 “Cold-Formed Metal Framing” for in- wall blocking as needed for attachment of rainscreen substructure.

3 SYSTEM DESCRIPTION

- A. Exterior Rainscreen Assembly: Solid phenolic core, fire-retardant, exterior grade rainscreen wall panels, aluminum substructure, attachment system components, air/vapor barrier membrane, continuous exterior insulation, and all accessories necessary for a complete rear-ventilated, weathertight exterior rainscreen wall system. Furnish fastenings and flashings as required to complete rainscreen system.

4 PERFORMANCE REQUIREMENTS

- A. General Performance: Solid phenolic exterior rainscreen wall panel system, aluminum substructure, and attachment accessories shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design Engineering: Design solid phenolic exterior rainscreen wall panel system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1. Design shall be inclusive of aluminum support structure system and all attachment accessories.
 2. Design shall be inclusive of solid phenolic exterior rainscreen wall panel manufacturing and shall conform to Manufacturer's recommended installation procedures.
- C. Structural Performance: Provide solid phenolic exterior wall panel system capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated based on Manufacturer's most current testing standards:
1. Wind Loads: Provide exterior rainscreen wall panel system, including aluminum support structure, capable of withstanding wind loads calculated according to requirements of authorities having jurisdiction or as determined based on the following minimum design wind pressures, whichever are more stringent:
 - a. Uniform pressure as indicated on Drawings.
 - b. As determined by the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," "Analytical Procedure".
- D. Deflection Limits: Aluminum support structure and exterior phenolic rainscreen panel system shall be designed in accordance with the Manufacturer's recommended maximum deflection when tested under positive and negative design wind gust loads and shall withstand wind gust loads with horizontal deflections no greater than the Manufacturer's allowable span.
- E. Thermal Movements: Exterior solid phenolic rainscreen panel system shall allow for thermal movements from ambient air and surface temperature changes by preventing buckling, opening of joints, over-stressing of components, failure of connections and other detrimental effects. Base calculations on surface temperature changes of materials due to both solar heat gain and nighttime-sky heat loss.
1. Panel shall remain stable for temperature Change (Range): -112 deg. F, ambient; 356 deg. F, material surfaces.
- F. Aluminum Support System: Provide aluminum support system capable of the following:
1. Design and install aluminum support structure to accommodate expected construction tolerances and misalignment, deflection of building structural components, and openings in the building enclosure as designed.

SUBMITTALS

- A. Product Data: For each type of product indicated. Include Manufacturer's written installation instructions, including recommendations for evaluating, preparing, and treating substrate, rainscreen panel technical data, material descriptions, and finishes and tested physical and performance properties.

- B. Shop Drawings: Show fabrication and installation layouts of solid phenolic exterior rainscreen panel, details of aluminum support structure conditions, anchorages for aluminum support structure, attachment system for panels, allowances for thermal expansion, trim, flashings, closures, corners, and accessories as required, and all special job specific details.
- C. Samples: For each type of exposed finish required, prepared on samples of size and type indicated below for approval:
 - 1. Rainscreen Wall Panels: Minimum 4" x 4" including fasteners and other wall panel accessories as required.
 - 2. Aluminum Support Structure: 12" long including fasteners and other accessories. Submit samples demonstrating materials, colors, and fastener attachment type.
- D. Installer Qualification Data: For Installer, provide certification signed by solid phenolic rainscreen panel Manufacturer certifying that Installer complies with requirements to perform the work specified in this Section.
- E. Qualification Data: For professional engineer.
- F. Engineering Design Certification: From solid phenolic rainscreen panel Manufacturer, provide certification of acceptance of final shop drawings and acceptance of qualifications for installer. Certification must be provided before the start of the Work.
- G. Closeout Submittals: From solid phenolic panel rainscreen panel Manufacturer, provide the following:
 - 1. Operation and Maintenance Data: Operation and maintenance manuals including methods for maintaining installed products, replacing damaged panels, and precautions against cleaning materials and methods detrimental to finishes and performance.
 - 2. FSC Chain of Custody Certificate.
 - 3. Environmental Product Declaration (EPD) Report
- H. Warranty: Sample of Manufacturer's standard 10 year limited warranty for solid phenolic exterior rainscreen wall panel system. Warranty shall be inclusive of material and labor for removal and reinstallation.

QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in the installation of exterior rainscreen wall panel systems who has a minimum of 3 years installing products indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is recognized and approved by the manufacturer as suitable for the execution of the Work.
- B. Fabricator Qualifications: A shop that employs skilled workers who custom fabricate solid phenolic or similar exterior rainscreen wall panel systems to those required for this Project and whose finished products have a record of successful in service performance and who is certified by the Manufacturer.

- C. Source Limitations: Obtain solid phenolic rainscreen panels and all auxiliary materials from a single-source Manufacturer who has a minimum of 25 years of experience in the manufacture of exterior rainscreen wall systems or an accessory Manufacturer who is certified by the solid phenolic rainscreen panel Manufacturer. Panels shall be manufactured in accordance with ISO9001 and ISO14001.
- D. Mock Ups: **(Optional)** Before construction of exterior rainscreen envelope, construct mock-up to verify selections made under approved submittals and to demonstrate typical joints, surface finish, texture, tolerances, attachments to building structure, methods of installation, connections to adjacent building enclosure materials, and standard and quality or workmanship. Build mock-ups to comply with the following requirements using materials indicated for completion of the Work:
1. Mock-up shall be a minimum of 100 sq. /ft. and shall demonstrate substrate surface preparation, air barrier membrane joint and crack treatment, solid phenolic rainscreen panel attachment, penetration sealing, connection to window and other adjacent building envelope materials, and standard of workmanship.
 2. Demonstrate continuity, air, and water tightness of air and water barrier and installation and attachment of continuous exterior insulation.
 3. Provide in-situ mock-up testing according to the Project requirements as specified herein by an independent testing agency approved and certified to perform such testing.
 4. If Architect determines that field constructed mock-up does not meet Project requirements, reinstall mock-up until approved.
 5. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed exterior solid phenolic rainscreen panel system. An undamaged field sample may become part of the completed Work.
 6. At the architects' discretion, the mock up may be part of the finished work.
- E. Pre-Installation Conference: Conduct pre-installation conference at Project site prior to commencing construction of mock-up specified herein to verify Project requirements.
1. Review solid phenolic rainscreen panel installation requirements including substrate surface preparation, environmental limitations, typical details and flashings, Manufacturer's recommended installation procedures, coordination with adjacent trades, testing and inspection procedures, protection and repair procedures.
 2. Ensure all sub-trades interfacing with or affected by the construction of the solid phenolic rainscreen panel system are present, including Architect, General Contractor, solid phenolic rainscreen panel Manufacturer, mock up and commissioning testing agencies, air barrier installer, exterior insulation installer, structural substrate installer, plumbing installer, window installer, electrical installer and any other installer whose work interfaces with or affects the solid phenolic rainscreen wall panels.

PROJECT CONDITIONS, STORAGE, AND HANDLING

- A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of solid phenolic rainscreen wall panels to be performed according to Manufacturer's written installation instructions and warranty requirements.
- B. Field Measurements: Verify actual panel measurements/openings by field measurement before fabrication to accommodate site tolerances and changes in construction.
- C. Comply with Manufacturer's stated ordering, lead-time, and manufacturing requirements to avoid construction delays.
- D. Deliver solid phenolic panel materials, aluminum support structure, and other manufactured accessory materials in Manufacturer's original, unopened, and undamaged containers with identification labels intact and visible. Package solid phenolic rainscreen panels for protection during transportation and handling. Comply with Manufacturer's and Distributor's written delivery and handling guidelines.
- E. Store solid phenolic rainscreen panels horizontally, covered with suitable weathertight and ventilated covering to prevent exposure to UV light and to ensure dryness with positive slope for drainage. Do not store panels in contact with ground or with materials that might cause staining, damage, scratching, or other surface damage.
- F. Phenolic panel installer shall notify the General Contractor or Construction Manager immediately upon discovery of any issues with the substrate i.e. improper framing, walls out of plumb, windows not properly aligned. These issues shall be appropriately addressed prior to continuation of panel system installation.
- G. Remove damage and waste panel material from site and legally dispose of according to authorities having jurisdiction.

WARRANTY

- A. Submit Manufacturer's standard limited 10 year warranty covering defects in material, warranty shall include labor for removal and reinstallation of defective material.
- B. Warranty only available when panels are installed and fabricated by an installation contractor that has been approved and trained by the manufacturer's representative to follow the recommended guidelines.

PART 2 - PRODUCTS

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SOLID PHENOLIC EXTERIOR RAINSCREEN WALL PANELS

- A. General: Subject to compliance requirements, provide solid phenolic rainscreen wall panels for exterior façade applications:
1. Basis of Design: Fundermax Max Exterior F Quality
 2. Alternate Products :
 - a. Cladding Concepts International 646-362-4750
 - b. Architects' Surfaces LLC 888-688-8892
- B. Product Description:
1. Rainscreen Material: Solid phenolic resin, fire-retardant exterior grade rainscreen panel.
 2. Rainscreen Panel Finish: (Standard Colors) (Woodgrains) (Material) (Metallic) finish # XXXX (or) as selected by Architect from Manufacturer's standard color range.
 3. Rainscreen Panel Core: Standard brown core comprised of kraft paper harvested from FSC Certified Forests and Thermosetting Resins, DF core and NFC core products will not be accepted.
 4. Rainscreen Panel Thickness: (8mm) (10mm) as indicated on drawings.
 5. Rainscreen Panel Standard Sizes: As indicated on drawings.
 6. Substructure: (Exposed Fastener Type) (Concealed Fastener Type) extruded aluminum profiles, clips, closures, and tees and indicated on the project drawings.
- C. Physical Properties:
1. Smoke Development Index: Less than 450 per ASTM E-84.
 2. Flame Spread Index: Less than 10 per ASTM E-84.
 3. NFPA268 Surface Ignition test, pass.
 4. Ignition Temperature; Greater than 650 degrees Fahrenheit above ambient, ASTM D1929
 5. When required by code, the assembly shall meet the performance requirements of NFPA 285. 10mm exposed fastener panels with assemblies listed in ICC ESR #3340 are acceptable as NFPA 285 compliant. Any variations must be approved by the local code official.

6. Panels shall have UV and weather resistance performance with a grey scale rating minimum of 4-5 per ISO 4892-2, 4892-3.
7. Panels shall be impact resistant per EN-ISO 178
8. Panels shall be scratch resistant per EN-438-6
9. Panels shall be FSC Certified.
10. Panels shall have an Environmental Product Declaration (EPD) Report
11. Panels shall be ICC AC92 compliant and have ICC Evaluation Services Report.
12. Panels shall be hail impact resistant, 70mm (2 3/4") ice ball at a velocity of 30 m/second (approx. 67 mph) with no breakage, discoloration or tearing. Tested per Austrian APBIC Standard, Association of Public Building Insurance Companies.

2 AUXILIARY MATERIALS

- A. Aluminum Support Structure: Extruded, finished, and color-matched for the type of use indicated on project Drawings.
- B. Attachment Accessories: Of type, size, corrosion-resistance, holding-power and color-matched as required to suit attachment to aluminum support structure.

3 FABRICATION

- A. General: Fabricate solid phenolic rainscreen wall panels and accessory materials in accordance with Manufacturer's written instructions and approved submittals, and at a fabrication facility trained and approved by Manufacturer. Comply with indicated profiles and within dimensional and structural requirements.

PART 3 - EXECUTION

1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances of structural substrate, aluminum support structure, solid phenolic rainscreen panel, and other conditions affecting performance.
 1. Verify that substrate conditions, wall framing, and other structural panel support members and anchorages installed under other sections are acceptable for product installation and have been installed within acceptable tolerances in accordance with Manufacturer's written instructions.

2. Verify that air and weather resistant barrier has been installed over structural sheathing in accordance with air barrier Manufacturer's recommend installation instructions and terminated properly at openings to prevent air infiltration or water penetration.
3. Examine rough-in installation for components and systems adjacent to and penetrating into solid phenolic rainscreen panels to verify actual locations of penetrations relative to joint locations of panels prior to panel installation.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

2 PREPARATION

- A. Aluminum Support Structure: Install clips, L-shapes, J-shapes, Z-shapes, hat channels, fillers, and other components in accordance with approved Shop Drawings and Manufacturer's recommended installation instructions.
- B. Install aluminum support structure framing level and plumb and within tolerances of the completed system as approved and recommend by Manufacturer and in accordance with approved Shop Drawings.
- C. Ensure air and water barrier is properly installed per air and water barrier Manufacturer's approved rainscreen wall panel installation instructions and is protected from UV light deterioration at panel open joint locations or is otherwise UV stable. Pay close attention to manufacturer's recommendations for treating penetrations in the membrane.
- D. Notify General Contractor or Construction Manager immediately upon discovery of any tears, holes, or other damages to the membrane or barrier.

3 SOLID PHENOLIC RAINSCREEN PANEL INSTALLATION

- A. Install solid phenolic rainscreen panels plumb and level and accurately spaced per Manufacturer's written installation instructions and in accordance with approved Shop Drawings.
- B. Fasten solid phenolic rainscreen wall panels to aluminum support structure with fasteners approved for use with adjoining construction and in accordance with approved Shop Drawings for color matching and to confirm compliance with wind load and engineering design requirements.
- C. Accessory Rainscreen System Materials: Install corner profiles, gaskets, trim, and joint closure strips as required with fasteners and adhesive appropriate for use with adjoining construction as indicated on drawings and as recommended by Manufacturer.
- D. Erection Tolerances: Install aluminum support structure within the required installation tolerances as recommended by Manufacturer and in accordance with approved Shop Drawings.
- E. Do not apply sealant to solid phenolic rainscreen panel joinery unless otherwise indicated on Drawings or in accordance with Manufacturer's recommended installation instructions.

CLEANING

- A. Upon completion of solid phenolic rainscreen wall panel installation clean finished surfaces as recommended by panel Manufacturer prior to Owners' acceptance.
- B. Legally dispose of all surplus materials off site.

END OF SECTION 074233