**SECTION 07 42 51**

**PORCELAIN CERAMIC RAINSCREEN**

**PART 1 - GENERAL**

**1.1 SUMMARY OF WORK**

A. Section Includes: Exterior wall cladding system consisting of flat exterior porcelain-grade ceramic cladding panels installed on an aluminum attachment substructure.

 B. Related sections:

1. Section 06100 – SHEATHING for sheathing behind façade system.
2. Section 06165 – AIR BARRIER over exterior sheathing.
3. Section 07210 – INSULATION installed behind facade system.
4. Section 07270 – AIR BARRIERS installed in cavity behind ceramic cladding panels.
5. Section 07600 – FLASHING AND SHEET METAL for coping, flashing, sheet metal work not part of façade assemblies.

**1.2 DESIGN REQUIREMENTS**

 A. Design and install ceramic cladding and attachment system to:

 1. Provide in conjunction with wall substrate and air barrier a weather tight wall assembly utilizing a drained and back-ventilated system.

1. System design shall be single-source responsibility by the cladding supplier. All design criteria shall be project specific in accordance with the requirements of ceramic cladding and support system manufacturer (**CLADDING CORP**) – Phone: (888) 826-8453. Products provided must conform to the design intent shown.

**1.3 CONTINUOUS INSULATION (CI).** System shall comply with ASHRAE 90.1 thermal performance requirements. System shall:

1. Be manufactured from AL6063-T6 extruded aluminum components
2. Shall be designed with independent non-continuous wall brackets to ensure optimal thermal and moisture performance when required to provide outboard insulation (CI) within cladding cavity.
3. System shall use stainless steel wall anchors
4. Provide a thermal analysis to show final U-value of cladding assembly to accommodate ASHRAE 90.1 performance requirements.

**1.4 SUBMITTALS**

1. Refer to Section 01 33 00 – Submittal Procedures
2. Product Data: Manufacturer’s data sheets on each product to be used, including, but not limited to:
	1. Preparation instructions and Recommendations
	2. Storage and Handling Requirement and Recommendations
	3. Installation methods for the supporting framework and the panels
3. Shop Drawings: Submit detailed shop drawings showing:
	1. Integrated engineered system with single source responsibility of shop drawings to incorporate panel manufacturer and sub-framing. Sub-framing must have fixed and sliding points that addresses thermal cycling for both panels and sub-framing. Engineering Calculations: Submit stamped calculations by licensed engineer as required by local building code
4. Samples
5. 3 inch by 12 inch minimum porcelaint color samples for selection by architect
6. Provide samples of each type of panel fastener
7. Provide manufacturer’s Design and Installation Manual
8. Provide test reports indication compliance with performance criteria.
9. Provide manufacturer’s sample warranty
10. Design Loads [as required by applicable codes for Project location]
11. System shall be optimized based on design loads
12. Maximum panel deflection: 1/300 [or applicable for product] 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
13. Comply with applicable seismic requirements for Project location
14. Adequately resist wind forces and uplift for Project location with minimum of [\_\_\_\_\_\_] [PSF] [kilopascals] [\_\_\_\_\_\_] for wall surface and [\_\_\_\_\_\_] [PSF] [kilopascals] for parapet and corner panels tested in accordance with ASTM E330
15. 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]
16. Accommodate tolerances of support structure
17. Provide panels and panel supports capable of the following:
	1. Wind Loads: Panel and sub-framing system design meets wind load requirements as defined by structural design and local building codes.
	2. Deflection Limits: Withstand deflection L/300 maximum

**1.5 QUALITY ASSURANCE**

1. Manufacturer Qualifications: Minimum of twenty (20) years’ experience in the production of porcelain panels
2. Installer Qualifications: Acceptable to panel manufacturer’s representative, with a minimum of five (5) years of proven experience in the installation of the specified products on projects of a similar size and scope.
3. Mock-up shall incorporate panels and all accessories cladding installation and submit report of observations and findings to Architect.
4. Attic Stock: Provide [\_\_] % extra stock per color in largest format size in use for project.

**1.6 DELIVERY, STORAGE, AND HANDLING**

1. Storage and handling to comply with manufacturer’s requirements.

**1.7 WARRANTY**

1. Manufacturer standard warranty against material failure for a period of ten (10) years from date of delivery. Warranty only available when material installed by certified installation contractor and shop drawings approved by manufacturer

**PART 2 - PRODUCTS**

**2.1 MANUFACTURER**

 A. Basis-of-Design Manufacturer : **CERAMIC5 Porcelain Rainscreen by** **Cladding Corp** **(**[**www.claddingcorp.com**](http://www.claddingcorp.com)**)**

 Phone: (888) 826-8453

 Represented locally by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 B. Panel Type – [**Insert CERAMIC5 Series Type**]. (Stone, Concrete, Clay, Metallic, Timber)

 C. Color – **[Insert Series Color for Standard Palette]** (Architect please define and/or call Cladding Corp for proper color selection).

 D. Size: Per drawings (Architect please define and/or call Cladding Corp for proper size selection).

 E. Thickness: no less than 9mm

 F. Attachment Methods *specify one*

 1. Exposed Clip (clips color matched to panel)

 2. Concealed undercut anchor. Kerf cuts not allowed.

 G. Requests to use equivalent products of other manufacturers shall be submitted in writing 10 days prior to bid in accordance with Section 01630 - Product Substitution Procedures. Architect reserves right to reject substitution request based on available sizes, color, or surface finish even though fabrication, materials, and performance are equivalent.

 H. Material performance requirements for ceramic panels:

1. Determination of Dimensions – complies to ASTM C499
2. Thickness – complies to ASTM C499
3. Chemical Resistance – complies to ASTM C650.
4. Breaking Strength – complies to ASTM C648
5. Water Absorption – complies to ASTM C373
6. Warpage – complies to ASTM C485
7. Frost Resistance – tested according to ASTM C1026 and unaffected
8. Resistance to Staining – tested according to ASTM 1378 and unaffected

**2.2 SUB-FRAMING SYSTEM**

1. Basis of Design: (Alpha Hci.13 (exposed) / Alpha Vci.40 (concealed)) **Cladding Corp**. ([www.claddingcorp.com](http://www.claddingcorp.com))

 Phone: (888) 826-8453

 Represented locally by:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Sub-Framing Requirements:
2. Thermal Modeling: Attachment system must be thermally modeled to demonstrate, at minimum, a compliance with ANSI/ASHRAE 90.1-2010 maximum U-Value for walls
3. Thermally Broken Sub-Framing: Continuous framing profiles (including C- or Z-shaped sections or furring) penetrating insulation are not permitted
4. Internal Shimming: Sub-framing will incorporate brackets with internal shimming for out of plumb conditions, with at least 1 1/2” of built in adjustability.
5. Cavity Ventilation: Sub-framing system shall accommodate positive drainage and ventilation for moisture control of the cavity
6. Flatness: Sub-framing System shall be flat with no noticeable warpage, buckling, deflection or other surface irregularities. The back plate shall not bend or deflect when compressed against the air barrier membrane but instead create a compression seal. Air Barrier Sealant: All brackets shall be pre-punched for sealant filling before setting screws. Seal punched bracket holes with Air Barrier manufacture approved Sealant.
7. Fasteners: Minimum 304 series stainless steel fasteners and anchors of type, size and spacing required for type of substrate and project conditions, to meet performance requirements specified and as indicated in design calculations and shop drawings. Grommet fasteners should be used to ensure face seal of the bracket.
8. Not Acceptable: Components made from galvanized steel, galvalume, or other carbon-based metals. Components made from FRP or fiberglass materials.
9. Sub-Framing Manufacturer: 15 years’ experience in rainscreen wall design in the United States.
10. Single Sourced Engineered System: Integrated engineered system with single source responsibility of shop drawings to incorporate panel manufacturer and sub-framing. Sub-framing must have fixed and sliding points that addresses thermal cycling for both panels and sub-framing.
11. Aluminum System: Made from 6000 series architectural grade aluminum to address corrosion.
12. Finishes: Brackets and L shapes in mill finish. Panel attachment profiles in black anodized finish.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

1. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of drained and back ventilated rain screen cladding
2. Do not proceed with cladding installation until deficiencies have been addressed

**3.2 PREPARATION**

1. Clean substrates of projections and substances detrimental to application
2. Coordinate panel installation with rain drainage work, flashing trim, soffit, roofing, parapet, wall and other adjoining work to provide a leak-proof, secure, and non-corrosive installation
3. Allow for scaffolding or mobile access to all parts of cladding

**3.3 INSTALLATION**

1. Install panels in accordance with manufacturer’s requirements and approved shop drawings.
2. Install panels with appropriate joint layout and configuration. Vertical and horizontal joints shall be open approximately 3/8” wide.

**3.4 CLEANING AND PROTECTION**

1. Panels should be handled and storage at jobsite per the manufacturer’s Design and Installation Manual.
2. Remove and replace broken, chipped, stained, or otherwise damaged panels.
3. Immediately after installing, wipe down panels. Do not use wire brushes, metallic tools, or abrasives for cleaning.
4. Protect cladding from roof run-off, splashed water, mud, sealants, bitumen, and other contaminants from remaining construction activities.
5. Without damaging completed work, provide protective boards at exposed external corners, which may be damaged by construction activities.

 **END OF SECTION 074251**