



SECTION 07 44 19
EXTERIOR PORCELAIN TILE CLADDING

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior porcelain tile cladding system.
- B. Metal framing support system.
- C. Flashing and trim.

1.2 RELATED SECTIONS

- A. Section 05 10 00 - Structural Metal Framing.
- B. Section 05 40 00 - Cold-Formed Metal Framing.
- C. Section 07 26 00 - Vapor Retarders.
- D. Section 07 27 26 - Fluid-Applied Membrane Air Barriers .
- E. Section 06 10 00 - Rough Carpentry.
- F. Section 07 25 00 - WeatherBarriers.
- G. Section 07 60 00 - Flashing and Sheet Metal.
- H. Section 07 91 26 - Joint Fillers.
- I. Section 08 41 13 - Aluminum-Framed Entrances and Storefronts.
- J. Section 08 44 13 - Glazed Aluminum Curtain Walls.
- K. Section 09 25 23 - Lime Based Plastering.

1.3 REFERENCES

- A. ASTM B 221 - Standard Specification for Aluminum-Alloy Extruded Bars, Rods, Wires, Shapes and Tubes.
- B. ASTM D 897 - Standard Test Method for Tensile Properties of Adhesive Bonds.
- C. ASTM D 1761 - Standard Test Method for Mechanical Fasteners in Wood.
- D. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

- E. ASTM E 283 - Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
- F. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors under the Influence of Wind Loads.
- G. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- H. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- I. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

1.4 PERFORMANCE REQUIREMENTS

- A. Design Requirements; design exterior porcelain cladding system to withstand:
 1. Positive and negative design wind loads acting normal to wall plane in accordance with Building Code and ASCE 7 with deflection of any member not to exceed $L/175$, as tested to ASTM E 330.
 2. Movement caused by an ambient temperature range of 120 degrees F and a surface temperature range of 160 degrees F.
- B. Performance Requirements:
 1. Air infiltration: Maximum 0.01 CFM per square foot, tested to ASTM E 283 at pressure differential across assembly of 6.24 PSF.
 2. Water resistance: No leakage, tested to ASTM E 331 at 12.0 PSF.
 3. Uniform load deflection:
 - a. Two panel specimen: No damage, tested to ASTM E 330 at 65 PSF positive and negative.
 - b. Single panel specimen: No damage, tested to ASTM E 330 at 260 PSF positive and negative.
 4. Uniform load structural:
 - a. Two panel specimen: No damage and maximum 0.07 inch permanent set, tested to ASTM E 330 at 97.5 PSF positive and negative.
 - b. Single panel specimen: No damage and maximum 0.150 inch permanent set, tested to ASTM E 330 at 390 PSF positive and negative.
 5. Impact resistance: No penetration, tested to ASTM E 1996 at 50 FPS.
 6. Freeze/thaw resistance: No delamination, cracking, chipping, or visible distortion; tested to GB/T 9966.1 at 25 cycles.
 7. Adhesive bond: Average bond strength of 284 PSI, tested to ASTM D 897.
 8. Tensile bond strength for adhesive: Average of 358 PSI, tested to ASTM D 897 after 25 thermo cycles.
 9. Shear load strength for riveted brackets: Average of 172 PSI, tested to ASTM D 1761.
 10. Surface-Burning Characteristics: Provide wall panels with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E 84.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.

- C. Shop Drawings: Include plans, elevations, and details, size and layout of panels, trim, accessories, supports, and attachments.
 1. Indicate panel numbering erection system.
 2. Differentiate between shop and field fabrication.
 3. Indicate substrates and adjacent work with which the wall system must be coordinated.
 4. Include large-scale details of anchorages and connecting elements.
 5. Include large-scale details or schematic, exploded or isometric diagrams to fully define flashing at a scale of not less than 1-1/2 inches per 12 inches.
- D. Design Data:
 1. Submit manufacturer's structural calculations showing sizes of framing members and loads applied to supporting structure based on design loads.
 2. Structural calculations shall be prepared by a professional engineer qualified in design of porcelain faced cladding system systems and licensed in state where wall system are to be installed.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (101 mm) square, representing actual product, color, and patterns.
- G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking and adjustment of cable tension and periodic cleaning and maintenance of all railing and infill components.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum of 5 years experience in the manufacturing of the panel product specified.
- B. Installer Qualifications: Minimum 3 years documented experience in work of this Section and acceptable to the manufacturer.
- C. Mock-Up: Provide a 4 foot high by 8 foot wide mock-up for evaluation of surface preparation techniques and application workmanship.
 1. Finish areas designated by Architect.
 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 3. Refinish mock-up area as required to produce acceptable work.
 4. Approved mockup may remain as part of the Work.
- D. Pre-Installation Conference:
 1. Convene at site 2 weeks prior to beginning work of this Section.
 2. Attendance: Architect, Owner, Contractor, panel manufacturer's representative, panel installer, and related trades.
 3. Review and discuss: Project conditions, scheduling, related work and other matters affecting erection.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's properly labeled, unopened packaging until ready for installation.
- B. Store panels off ground; prevent contact with materials that could cause staining or damage.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication, as the project schedule permits.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

- A. Provide manufacturer's limited 10 year warranty against delamination and separation of panel components

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: TerraCORE Panels, which is located at: 2030 Irving Blvd. ; Dallas, TX 75207; Toll Free Tel: 877-503-2062; Tel: 214-749-0999; Fax: 214-742-2804; Email:[request info \(info@terracorepanels.com\)](mailto:info@terracorepanels.com); Web:terracorepanels.com
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 EXTERIOR PORCELAIN TILE CLADDING

- A. Description: TerraCORE Exterior is an aluminum "T" HoneyComb substrate bonded to a porcelain tile. Sandwiched between the honeycomb and the tile is a 1 mm thick, highly elastic, interwoven bi-directional fiberglass cloth that is saturated with a high strength epoxy resin that is used to bond these two materials together.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area that correspond with the support system indicated.
- C. Lightweight Porcelain Panels:
 - 1. Type: Porcelain tile bonded to fiberglass top sheet and lightweight aluminum honeycomb core, with aluminum sheet backing.
 - 2. Material: ASTM 547, Alloy AA303.
 - 3. Weight:
 - a. 3.65 lbs/sf.
 - 4. Thicknesses: 3 mm.
 - a. Fiberglass Top Sheet: 1 mm.
 - 1) 8 mm.
 - 2) 12 mm.
 - 3) 17 mm.
 - 4) 23 mm.
 - 5) ___ mm.
 - b. Aluminum backing sheet: 1 mm anodized.
 - c. Overall panel thickness: ___ mm.
 - 1) 10 mm.
 - 2) 14 mm.
 - 3) 19 mm.
 - 4) 25 mm.
 - 5) ___ mm.
 - d. _____

- D. Aluminum Extrusions:
 - 1. ASTM B 221, 6063-T5 or T6 alloy and temper.
 - 2. Finish:
 - a. Clear anodized where exposed.
 - b. Bronze anodized where exposed.

2.3 METAL FRAMING SUPPORT SYSTEM

- A. Channels:
 - 1. Channel Material: ASTM B 429, Alloy 6005-T5.
 - 2. Interlocking Channel Clips: Factory applied interlocking channel clips fastened to panels with pop rivets.
 - 3. Interlocking Channel Rail: Field installed interlocking channel rail fastened to structural backing with recommended fasteners.
 - 4. Type:
 - a. Wide
 - b. Narrow

2.4 ACCESSORIES

- A. Fasteners: Concealed type except where unavoidable and suited to application, stainless or corrosion resistant coated steel.
- B. Joint Sealers: Type recommended by panel manufacturer as specified in Section 07 91 26 - Joint Fillers.
- C. Flashing: Fabricate from 0.030 inch (0.76 mm) minimum thickness aluminum sheet painted to match the adjacent panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.

2.5 FABRICATION

- A. Fabricate manufacturer's standard interlocking channel system. System shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction. 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.
- B. Attach channels to back of panels in factory.
- C. Where indicated shop fabricate panel returns in factory with hairline joints.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Install interlocking channel system properly aligned for the panel installation.
- C. Set panels aligned, level, and plumb. Shim as required with hard plastic shims up to a maximum of 1/2 inch thick.
- D. Fasten receiving channels to supports. Snap panels into receiving channels. Use silicone sealant in bed of channel if recommended by the manufacturer.
- E. Seal panel joints with joint sealer specified in Section 07 91 26 - Joint Fillers.
- F. Allowable Tolerances:
 - 1. Maximum offset from alignment of adjacent members in same plane: 1/16 inch.
 - 2. Maximum variation from plane: 1/8 inch in 10 feet, noncumulative.
 - 3. Maximum variation from indicated position: 1/4 inch.
- G. Separate dissimilar metals and use gasket fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace panels damaged beyond repair as a direct result of the panel installation.
- B. Repair panels with minor damage as acceptable to the Architect.
- C. Remove masking (if used) as soon as possible after installation.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Prevent staining of porcelain from mortar, grout, sealants, and other sources. Immediately remove such materials from surface without damage to the panel.
- C. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 SCHEDULES

- A. :
- B. :

END OF SECTION