

SECTION 075430 - CLADDING SUPPORT SYSTEM FOR RAINSCREEN

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide a thermally broken, non-continuous, aluminum Support System for attachment of various siding types, installed in conjunction with exterior insulation. System shall be designed to incorporate flashing components, drainage components and air vapor barrier in a way that enables the system to drain and ventilate properly.
- B. Provide for the overall design of the rainscreen system including finish panels. Refer to Section 074622 For Terracotta Rainscreen panels and insulation.
- C. Terra-Cotta Panels shall be fastened to the panel manufacturer's carrier track system with aluminum clips, (see Section 07462, Terra Cotta Panel Rainscreen System).

1.02 RELATED SECTIONS

- A. Terra Cotta - Section 07462
- B. Cold-formed Metal Framing - Section 05400
- C. Metal Fabrications - Section 05500
- D. Fluid-Applied Membrane Air Barrier, Vapor Retarding - Section 07272
- E. Aluminum Composite Wall Panels - Section 07420

1.03 SUSTAINABILITY REQUIREMENTS

- A. Sustainability requirements included in the Section are as follows:
 - 1. Documentation of recycled materials.
- B. The Contractor shall implement practices and procedures to meet the Project's sustainable requirements. The Contractor shall ensure that the requirements related to these goals, as defined in Specification Section S01352, Sustainability Requirements, and as specified in this Section, are implemented to the fullest extent. Substitutions or other changes to the work shall not be proposed by the Contractor or their sub-contractors if such changes compromise the stated Sustainable Design Performance Criteria.

1.04 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and

requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- B. ASTM International (ASTM):

C1513 Standard Specification for Steel Tapping Screws for Cold Formed Steel Framing Connections.
- C. American Society of Civil Engineers (ASCE) Publications:

ASCE 7-16 – Minimum Design Loads for Buildings and Other Structures.
- D. International Code Commission (ICC) Evaluation Services:

ICC ES AC193 – Acceptance Criteria for Mechanical Anchors in Concrete Elements.
- E. IBC 1403.2: Reference Standard for Selection of Weather Resistive Barriers.
- F. AAMA 509: Test and Classification Method for Drained and Back-Ventilated Rainscreen Wall Cladding Systems.
- G. **2022** NYC Building Code

1.05 PERFORMANCE/DESIGN CRITERIA

- A. Structural Design: Provide engineered design capable of withstanding combined effects of stresses from dead loads, wind loads, normal thermal movement and other anticipated stresses without evidence of permanent defects or failure. Spacing also to be dependent on the rainscreen material selected and how far the units can span.
 - 1. Wind Load: As per Chapters 27 through 31 of ASCE 7 per Chapter 16 of the 2022 NJ- IBC.
 - 2. Dead Loads: Design for loading to accommodate support of cladding systems specified by related sections and shown on Drawings and as required by 2022 NJ- IBC.
 - 3. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as per Chapter 13 of ASCE 7.
- B. Thermal Expansion and Contraction: Design for movement due to cyclic day and night temperatures to not exceed safety factors for fasteners, joints, seals and components.
- C. Cladding Accommodation: Design framing support assembly to maintain dimensions to face of cladding materials indicated on Drawings. Design framing supports configuration, size, spacing and make adjustments as needed to accommodate support for each cladding type.
- D. Rainscreen Design: Design ventilating system assembly to accommodate movement of air movement into the rainscreen cavity and move water vapor out.

E. Tolerances:

1. Accommodate deflection of structural members.
2. Maintain clearances at adjacent construction.
3. Prevent load transfer to non-structural elements.

F. Thermal Barriers:

1. Thermally isolate metal components from each other and support wall.
 - a. Maximum contact area between isolator and sheathing: 3.15 square inches.
 - b. Maximum thickness: 0.375 inches.
 - c. Shims that may be used for plumb and true alignments must not increase thermal isolation contact area.
2. Thermally isolate fasteners from metal using thermal isolation washers or other means.
 - a. Minimum thickness: 0.125 inches.

G. Thermal Insulation: As specified by Section 074622, Terra Cotta Rainscreen System.

1. Design Thickness and type of insulation into system assembly.
2. Perform thermal analysis to determine framing System's effect on wall assembly.

1.06 SUBMITTALS

A. Product Data

1. Submit product data for all components, connections and anchorages. Include installation instructions, clearances, special procedures and conditions requiring special attention.
2. Provide manufacturer's sample warranty.

B. Shop Drawings

1. Location, Layout and Dimensions of support system members, including special pieces and trim.
2. Locations of fixed and sliding fastening points.
3. Details at top, bottom, corner, windows, doors, etc.

4. Installation details: attachment methods, fasteners, joints, corners, openings, intersections with adjacent materials, flashings, closures, trim and other critical conditions.
 5. Interface of aluminum assembly with adjacent construction.
 6. Stamped and signed by a licensed professional engineer, registered in New Jersey.
- C. Design Calculations
- Comprehensive analysis of design loads, including dead loads, live loads, wind loads and thermal movement based on panel selected.
- D. Samples
1. Submit three (3) samples of each component and fasteners of the assembly.
 2. Submit sample of stainless steel anchor and descriptive literature indicating its characteristics; submit laboratory report certifying pullout and shear capabilities for the anchor embedded in the back-up wall substrate material to be used in this Project.
- E. Quality Control Submittals
1. Test Data: Independent test results or engineered analysis for performance signed by an independent agency representative.
 2. Thermal Analysis Report indicating assembly U-values for the following exterior wall system
 3. Qualifications
 - a. Rainscreen cladding support manufacturer
 - b. Rainscreen cladding support installer
 - c. Rainscreen cladding designer
 4. Mock-ups
- F. Provide Manufacturer's Warranty.
- G. Sustainable Submittals
1. Submit Contractor's Sustainable Materials Form with complete information on recycled content for materials provided under the work of this section in accordance with Section S01352, Sustainability Requirements. Include cost of materials and percentage, by weight, of materials that have post-consumer or pre-consumer recycled content for the following:

- a. Recycled content.
2. Submit documentation of recycled content, if any, in extruded foam and fiber insulation materials – product data, mix design information, or manufacturer's statement.

1.07 QUALITY ASSURANCE

A. Qualifications

1. Manufacturer: Company with the successful manufacturer of materials meeting the specifications for five years.
2. Installer: Provide a list of at least 5 projects completed successfully of equivalent scope and quality.
3. Cladding support designer: Design of the support system shall be by a licensed Professional Engineer registered in State of New Jersey with experience in the design of rainscreen support systems.

B. Mockups: Provide panel minimum 300 SF (approx. 20'x14') or as indicated on drawings.

1. Construct support system mockup panel to illustrate substrate, air barrier, insulation, framing, flashing, thermal isolation, and treatments at fenestrations, corners and transitions.
2. Verify mockup as conforming to manufacturer's instructions and provisions of Contract Documents.
2. If not approved, remove mockup and install new panel (or panels) repeating the process until panel is approved.
3. Do not begin work of this section until after inspection by manufacturer's representative is complete and mockup has been accepted in writing by the Architect of Record and by the NYC School Construction Authority.
4. Protect and maintain accepted mockup as standard of quality for work of this section.
5. Accepted mockup may be incorporated into the work of this Section.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Conform to Manufacturer's instructions.
- B. Ordering: Coordinate with manufacturer's ordering lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

- D. Store and handle to keep clean, dry, well ventilated and protected from damage due to weather and construction activities.

1.09 WARRANTY

- A. Manufacturer: Provide 15-year materials warranty covering defective materials of extruded aluminum framing system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Cladding Support System Manufacturers for Terracotta Panels and ACM with Tracks and Concealed Clips:
 - 1. The cladding support system manufacturer shall supply all components, except for the horizontal or vertical carrier rail and clips.
 - a. NVELOPE USA, LLC.
1546 NW 56th Street, Seattle WA 98107
“NVELOPE NV1-System” Vertical Support System or “NVELOPE NH3-System” Horizontal Support System
 - b. ECO Cladding
420 N Cedros Avenue, Suite 103,
Solana Beach, CA 92075
“Alpha or Sigma VCI.10 Vertical Support System” or “Alpha or Sigma HCI.10 Horizontal Support System”
 - 2. All aluminum vertical or horizontal carrier rails and all aluminum clips are to be supplied by the individual panel manufacturer that is supplying the panels. The carrier rail and clip product shall be the type required for the specific panel.

2.02 EXTRUDED ALUMINUM/STAINLESS STEEL SUB-FRAMING

- A. General: Thermally broken, non-continuous, aluminum cladding support System, made from 6000 series architectural grade aluminum. The system shall be comprised of stainless steel self-shimming brackets with a thermal break and aluminum L-Profile vertical or horizontal framing.
- B. Gauge, Configuration, Dimensions and Spacing: Minimum gauge and as required to conform to design criteria as per Manufacturer’s specifications.

Material: Alloy – 6000 series architectural grade aluminum appropriate for rainscreen cladding support system. Stainless steel shall be grade 304.
- C. Wall Brackets
 - a. Stem for connecting L-Profile vertical or horizontal framing rail to bracket: Must not penetrate exterior layer of insulation.

- a. Pre-punched Holes: For easy engagement and placement of stainless steel self-tapping hex-head screws for use in attaching L-Profile vertical or horizontal framing rail.
- b. Brackets shall be stainless steel, self-shimming for out of plumb conditions.
- c. Brackets shall include a thermal barrier pad/isolator.

2.03 MATERIALS NOT ACCEPTED

- A. Continuous framing profiles (including C- or Z-shaped sections or furring) penetrating insulation.
- B. Components made from galvanized steel, galvalume or other carbon based metals.
- C. Components made from FRP or fiberglass materials.

2.04 THERMAL BARRIER

- A. Material:
 - 1. Injection molded Polypropylene Copolymer.
- B. Size:
 - 1. Size to accommodate plate
 - a. Framing member to framing member isolation. Minimum 0.125 inch thick
 - b. Isolator must match support bracket and must not decrease structural performance of system.
- C. Recommended Product
 - 1. As recommended by Cladding Support System manufacturer.

2.05 CONNECTORS AND ANCHORS

- A. Screw Fasteners
 - 1. 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 as indicated in design calculations and shop drawings.

2.06 SOURCE QUALITY CONTROL

- A. Single Source Responsibility: Furnish engineered design and fabrication by or under direct responsibility of single manufacturer.

2.07 PREINSTALLATION CONFERENCE

- A. Before fabrication of the panels is scheduled to commence, a conference will be called by the Authority's Representative at the site for the purpose of reviewing the mock-up panels, the Drawings and the Specifications and discussing requirements for the Work. The conference shall be attended by Authority's representatives (Construction management and CID), the Contractor, the authorized fabricator's Company Field Advisor and Engineer, the certified installer's Company Field Advisor, the superstructure contractor, Special Inspection Agency and the Architect/Engineer of Record.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify conditions ready to receive work of this Section before beginning.
- B. Backup Wall: Verify level and plumb, free of defects, and conforming to tolerances suitable for installation of subsequent work.
- C. Weather Resistive Barrier: Verify complete, cured and conforming to manufacturer's instructions. Verify fenestrations, transitions, discontinuities and sills and ledgers flashed and sealed to move moisture to exterior of building as part of air barrier system.

3.02 PREPARATION

- A. Review areas of potential interference and conflicts and coordinate layout and support provisions for interfacing work.
- B. Adjust and perform work as necessary for plumb and true alignments.

3.03 INSTALLATION

- A. Conform to manufacturer's instructions and provisions of Contract Documents.
- B. Erect cold-formed rainscreen assembly to be level, plumb and in alignment with building features including corners, off-sets and fenestrations.
- C. Wall Brackets and L-Profile Vertical or Horizontal Framing Rail
 - 1. Mount wall brackets at 16 inch on center Horizontally on support wall (at each stud Location), using self-drilling self-tapping Screws at metal stud framed walls and expansion or adhesive anchors at concrete and masonry walls.
 - a. Lay brackets out at an even 0.5 inch increment vertically or horizontally.
 - b. Tighten snug tight, as instructed by fastener manufacturer instructions.
 - c. Where using snug tight criteria, verify torque for each installer using hand tools at beginning of project.
 - 2. Thermally isolate wall bracket attachments by sandwiching thermal break material between metal bracket and support wall substrate.

3. Isolate screw fastener washers using material to thermally isolate fastener heads from metal bracket.
 4. Place shims the same size and profile as the isolator between the sheathing and bracket isolator to account for irregularities in support wall.
 5. Establish and re-establish and restart vertical bracket locations using laser or chalk-line at fenestrations and other obstructions to establish horizontal alignments.
- D. Semi-rigid mineral wool insulation: Install to expand into and tightly fit between wall brackets to make continuous, unbroken insulated face of wall as indicated in the rainscreen section.
- E. Install continuous horizontal or vertical framing support rail with engineered fasteners.
- F. Attach exterior cladding in compliance with manufacturer's recommendations and requirements.
- G. Touch-up shop-applied protective coatings damaged during handling and installation.

3.04 ERECTION TOLERANCES

- A. Manufacturer's Field Technical Service: Make intermittent and final inspection to verify installation in conformance to manufacturer's instructions and suitable as framing assembly for subsequent cladding installations.
1. Confirm snug tight and fastener sizing.
 2. Confirm framing members installed in correct Orientation.

3.05 ADJUSTING

- A. Inspect and adjust after installation. Replace or repair defective work.
- B. Adjust and reconfigure as necessary to accommodate cladding systems for installations over work of this section. Do not reuse pre-drilled holes unless fastener size is increased.

END OF SECTION