SECTION 074210

WALL CLADDING SUPPORT SYSTEM

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Exterior wall panel support system.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1. Section 054000 – COLD-FORMED METAL FRAMING for exterior wall framing.
2. Section 074200 – METAL WALL PANELS for exterior cladding.
3. Section 074300 – FIBER-CEMENT WALL PANELS for exterior cladding.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design support system and framing, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Provide support system and framing capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As required by code.

C. Structural Performance:

1. Framing Members:

a. Test framing components to AAMA TIR- A8-[04] – Section 7.2 to determine structural performance and effective moment of inertia for each perforated component. Minimum Effective Moment of Inertia for Primary Rail: 0.0134 in4.
b. Localized bending stress for eccentrically loaded framing members must be evaluated with the maximum effective length of resisting element not more than 12 inches.

2. Fasteners:

a. Tension shall be taken as sum of direct tension plus tension due to prying for eccentrically loaded connections. Prying may be reduced or eliminated if proven via engineering analysis or testing.
b. Minimum Safety Factor of 3 for both tension and shear values.
c. Combined tension and shear shall be evaluated according to an interaction formula. Sum of terms shall not exceed 1.0.

D. System Thermal Design: Installed continuous insulation system including insulation, composite framing support, sub-girts, clips and cladding attachment shall not have thermal bridging of fasteners or framing that creates a continuous metal path from the exterior surface of the insulation to the stud framing inside the wall cavity or interior face of wall. System thermal design shall meet/exceed the thermal and design requirements per the Code.

E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

1.4 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

C. Delegated-Design Submittal: For framing indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Welding certificates.

E. Qualification Data: For professional engineer.

F. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:

1. Steel sheet.
2. Expansion anchors.
3. Power-actuated anchors.
4. Mechanical fasteners.
5. Vertical deflection clips.
6. Miscellaneous structural clips and accessories.

1.5 QUALITY ASSURANCE

A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.

C. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.

D. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

E. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

F. Mock-Up: Provide labor and materials for mock-ups specified in Section 014330 – MOCK-UPS.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 RAINSCREEN ATTACHMENT/SUPPORT FRAMING SYSTEM

A. Coating Material: ASTM A1046, Zinc-Aluminum-Magnesium, minimum thickness ZM40.

1. ASTM A653 Galvanized steel is not acceptable.

B. Steel Classification: Structural Steel (SS), Grade 50, 50 ksi Yield.

C. Spacing: Comply with manufacturer’s Professional Engineer’s project specific calculations.

D. Wall Brackets: Minimum 0.074 inch thick (14 gauge) sheet steel.

E. Dimensions:

1. Bracket Base: Minimum 3.125 inch high by 2.125 inch wide.
2. Offset Brackets: As indicated on the Drawings.

a. Align offsets to differing wall planes as shown on Drawings.

3. Pre-Punched Holes: Two wall anchors per bracket.
4. Recommended Product: ThermaBracket-S by Knight Wall Systems or approved equal.

F. Primary Horizontal Rail.

1. Minimum 0.054-inch thick (16 gauge) cold-formed steel.
2. Profile: C channel, two flanges of equal length and one web.
3. Nominal Dimensions: Minimum 1.0 inch flange for attaching to wall bracket and 1.625 inch at web.
4. Pre-Punched Attachment Holes: 1.0 inch on center along length of track and oversized allowing for thermal contraction and expansion of rail without placing stress on brackets.
5. Basis-of-Design: Static S-Series, S-Rail by Knight Wall Systems or approved equivalent.

G. Thermal Isolation:

1. Material: Injection molded Polyoxymethylene copolymer (POM), non-fiber reinforced.
2. Tensile Yield Strength: 9.57 ksi per ISO 527.
3. Melting Temperature: 329 degrees Fahrenheit per ISO 3146.
4. Components:

a. Wall Anchor Isolation Washer: minimum 0.125 inch thick.
b. Support Wall Substrate Isolation: Minimum 0.375-inch thick at each wall bracket.
c. Rail to Bracket Isolation: Minimum 0.125 inch thick at each connection.
d. Bracket Shim: Match support wall substrate isolator profile; available in 0.125-inch thickness and does not decrease thermal or structural performance of system.

5. Basis-of-Design: ThermaStop™ Isolators by Knight Wall Systems.

H. Fasteners:

1. Sufficient length to provide solid attachment to structure as required by manufacturer.
2. Thermally isolated.
3. Framed substrate with sheathing: Self-drill hex-washer-head stainless steel with 1,000 hour salt-spray rated thermoset polyester coating.

a. Embedment depth: 0.625 inches or three full threads minimum, whichever is greater.
b. Minimum ultimate pull-out capacity from 18 gauge steel: 450 pounds.

I. Accessories:

1. Bracing, Furring, Bridging, Plates, Gussets, and Clips: Formed sheet steel, thickness as necessary to meet structural requirements for special conditions encountered.
2. Galvanic Protection: Utilize tapes and other methods as necessary to separate and prevent contact between dissimilar metals.

2.2 INSULATION

A. Refer to Section 072100 – THERMAL INSULATION.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas of this work, and project conditions with installer present for compliance with requirements for installation tolerances, substrates, wall panel support conditions, and other conditions affecting performance of this Work.

B. Examine structural wall framing to ensure that angles, channels, studs, and other structural support members have been installed within alignment tolerances required by continuous insulation wall panel support system manufacturer.

C. Verify that water resistive barrier has been installed over exterior sheathing to control air infiltration or water penetration as indicated for project.

D. Examine rough-in for components and systems penetrating wall panel support system to coordinate actual locations of penetrations relative to exterior wall panel joint locations prior to installation.

E. Verify that mechanical and electrical services for exterior walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

F. Proceed with installation only after exterior walls have been properly prepared and unsatisfactory conditions have been corrected.

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.

C. Prepare sub-girt, base angles, sills, furring, and other wall panel support members and provide anchorage in accordance with ASTM C 754 for gypsum panel type substrates and panel manufacturer’s installation instructions.

3.3 INSTALLATION, GENERAL

A. Install wall panel support system in accordance with manufacturer's installation instructions.

B. Install system to fill-in exterior spaces without gaps or voids. Do not compress panel insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Exposed insulation must be protected from open flame and kept dry at all times.

F. Exterior wall insulation panels are not intended to be left exposed for periods of time in excess of 60 days without adequate protection.

1. When extended exposure is anticipated, protect exposed insulation surfaces including corners, window and door openings with a compatible waterproof tape.

G. Install wall panel support system in compliance with exterior wall panel orientation, sizes, and locations as indicated on Drawings.

3.4 3TOLERANCES

A. Shim and align wall panel units with installed tolerances of 1/4 inch in 20 feet, non-cumulative, on level, plumb, and location lines as indicated.

3.5 FIELD QUALITY CONTROL

A. Testing: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

1. Refer to section 074200 for additional requirements.

3.6 PROTECTION

A. Protect installed products from damage until date of Substantial Completion.

B. Ensure that insulation panels are not exposed to moisture.

1. Remove wet insulation panels or allow them to completely dry prior to installation of exterior wall panel system.

C. Replace damaged insulation panels prior to date of Substantial Completion.

END OF SECTION