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SECTION 07 42 13
METAL WALL PANELS
Kingspan Insulated Panels
Kingspan K-Roc HF Series Insulated Wall Panel System

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Steel faced, mineral wool core fire resistive insulated wall panels for [exterior walls] [exterior fire rated walls] [interior partitions] [interior fire rated partitions]
- B. Accessories including fasteners and perimeter trim

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA)
 - 1. AAMA 501: Test Method for Exterior Walls
 - 2. AAMA 501.2: Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems.
- B. ASTM International
 - 1. ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 2. ASTM A755: Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
 - 3. ASTM A792: Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
 - 4. ASTM A924: Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
 - 5. ASTM C165: Standard Test Method for Measuring Compressive Properties of Thermal Insulations
 - 6. ASTM C303: Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation
 - 7. ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
 - 8. ASTM C612: Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
 - 9. ASTM C1104: Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation
 - 10. ASTM C356: Standard Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat
 - 11. ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
 - 12. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
 - 13. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
 - 14. ASTM E136: Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C

15. ASTM E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
16. ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
17. ASTM E814: Standard Test Method for Fire Tests of Penetration Firestop Systems
18. ASTM E1105: Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference

C. National Fire Protection Agency (NFPA)

1. NFPA 259: Standard Test Method for Potential Heat of Building Materials.
2. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

D. Underwriters Laboratories (UL)

1. UL Canada (ULC) Approval:
 - a. CAN/ULC-S101: Standard Methods of Fire Endurance Tests of Building Construction and Materials
 - b. CAN/ULC-S114: Standard Method of Test for Determination of Non-Combustibility in Building Materials
 - c. CAN/ULC-S115: Standard Method of Fire Tests of Firestop Systems
 - d. CAN/ULC-S102: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

E. FM Global (FM)

1. Approval Standard 4880; Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Exterior Wall Systems.

1.3 SUBMITTALS

- A. Refer to Section **[01 33 00 Submittal Procedures]** **[insert section number and title]**.
- B. Product Data: Submit manufacturer current technical literature for each type of product.
- C. Shop Drawings - Submit detailed drawings showing:
 1. Profile
 2. Gauge of both exterior and interior sheet
 3. Location, layout and dimensions of panels
 4. Location and type of fasteners
 5. Shape and method of attachment of all trim
 6. Locations and type of sealants
 7. Installation sequence
 8. Coordination Drawings: Provide elevation drawings and building sections which show panels in relationship to required locations for structural support. Include panel details and details showing attachment to structural support.
 9. Other details as may be required for a weathertight installation

- D. Panel Analysis: Provide panel calculations to indicate compliance with maximum deflection of [L/180] [L/240] for the indicated wall design loads. The design load / deflection criteria and fastening pattern shall be verified from witnessed / audited tests using the “Chamber Method” in accordance with ASTM E72. Include effects of thermal differential between the exterior and interior panel facings.
- E. Samples: Provide nominal 3 x 5 inch of each color indicated. [Provide panel width by 10 inches long minimum] [Insert size].
- F. LEED Submittals:
 - 1. Energy and Atmosphere
 - a. Energy Analysis: Demonstrating percentage of performance improvement compared with the baseline building performance rating.
 - 2. Material and Resources
 - a. Building Life-Cycle Impact Reduction
 - 3. Indoor Environmental Quality
 - a. Low Emitting Materials: Compliance sheets indicating adhesives and gasket are within the published VOC emissions thresholds
 - 4. Innovation in Design (ID)
 - a. Documentation for Credit: [Include specific requirements related to documenting credit.]
- G. Quality Assurance Submittals
 - 1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with requirements.
 - 2. Manufacturer Erection Instructions: Provide manufacturer’s written installation instructions including proper material storage, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of five (5) years experience in the production of fire resistive insulated metal wall panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.
- B. Installer Qualifications:
 - 1. Installer shall be authorized by the manufacturer and the work shall be supervised by a person having successfully completed a manufacturer training seminar regarding proper installation of the specified product.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Refer to Section [01 60 00 Product Requirements] [insert section number and title].
- B. Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.
- C. Store wall panel materials on dry, level, firm, and clean surface. Stack no more than two bundles high. Elevate one end of bundle to allow moisture run-off, cover and ventilate to allow air to circulate and moisture to escape.
- D. Mineral fiber core shall be protected from moist air, rain and UV during construction. Stored panels must be wrapped in plastic or tarpaulins. Protect exposed mineral fiber from rain or water with plastic sheet during installation.

1.6 WARRANTY

- A. Limited Warranty: Standard form in which manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period. The items covered by the warranty includes panel performance, bond integrity, deflection and delamination.
 - 1. Warranty Period: Two (2) years from date of Substantial Completion, or 2 years and 6 months from the date of shipment from manufacturer's plant, whichever occurs first.
- B. Panel Finish Warranty: Submit Manufacturer's limited warranty on the exterior paint finish for adhesion to the metal substrate and limited warranty on the exterior paint finish for chalk and fade.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Kingspan Insulated Panels Ltd. 12557 Coleraine Drive, Caledon, ON L7E 3B5 (866-442-3594); 5202-272nd Street, Langley, B.C. V4W 1S3 (866-442-3594) (www.kingspanpanels.ca);
- B. Kingspan Insulated Panels, Inc., 726 Summerhill Drive, Deland, FL 32724 (888-882-5862); 2000 Morgan Road, Modesto, CA 95358 (800-377-5110), 1509 Dewitt Ave, Mattoon, IL 61938 (www.kingspanpanels.us)
- C. Basis of Design: Kingspan K-Roc HF
- D. Substitution Limitations:
 - 1. Submit written request for approval of substitutions to the Architect [a minimum of [14] days prior to the date for receipt of bids] [Insert time period]. Include the following information:
 - a. Name of the materials and description of the proposed substitute.
 - b. Drawings, cut sheets, performance and test data.
 - c. List of projects similar scope and photographs of existing installations.
 - d. Test reports indicating compliance with the performance criteria.
 - e. Other information necessary for evaluation.

2. After evaluation by Architect, approval will be issued via addendum. No verbal approval will be given.
3. Substitutions following award of contract are not allowed except as stipulated in Division 01 – General Requirements.

2.2 WALL PANELS

A. Design Criteria:

1. Wind Loads: [As indicated on Drawings] [Insert positive and negative loads (psf) for Components and Cladding Zones 4 and 5].
2. Deflection criteria shall be [L/180] [insert project specific deflection criteria].

B. Performance Criteria:

1. Structural Test: Structural performance shall be verifiable by witnessed structural testing for simulated wind loads in accordance with ASTM E72. Deflection criteria shall be [L/180][L/240] [insert project specific deflection criteria].
2. Thermal Properties: The panel mineral fiber core shall provide an R-value of 3.8 per inch thickness when tested in accordance with ASTM C518.
3. Penetration and Firestop Test: panels meet requirements according to ASTM E814 when installed as per listed assembly.
4. Water Penetration: There shall be no uncontrolled water penetration through the panel joints at a pressure differential of [6.24 psf, 2hrs] [20 psf, 15min] when tested in accordance with ASTM E331.
5. Air Infiltration: Air infiltration through the panel shall not exceed 0.03 cfm/sf at 6.24 psf air pressure differential when tested in accordance with ASTM E283.
6. Insulating Core:
 - a. Density: 8.5 lb. /cu. ft. +10%. -5%; in accordance with ASTM C303.
 - b. Combustibility: Does not meet the “pass” criteria, specified by ASTM E136.
 - c. Combustibility: Non-combustible when tested in accordance with ULC-S114.
 - d. Apparent thermal conductivity of mineral fiber core: R value / inch at 75° F. mean temp. - R=3.8 ft² °F h / Btu in in accordance with ASTM C518.
 - e. Compressive Strength: 45 kPa (6.5 psi) @ 10% compression in accordance with ASTM C165.
 - f. Dimensional stability: Linear shrinkage 0.2% at 1200° F in accordance with ASTM C356.
 - g. Moisture resistance: Water Vapor Sorption - 0.0 vol% in accordance with ASTM C1104.
 - h. Surface burning characteristics when tested in accordance with ASTM E84:
 - i. Flame Spread: 0
 - j. Smoke Developed: 0
 - k. Surface burning characteristics when tested in accordance with CAN/ULC S-102:
 - a) Flame Spread Rating: 0
 - b) Smoke Developed Classification: 0
7. Fire Test Response Characteristics: Steel-faced panels with mineral wool core shall comply with appropriate sections of Chapter 7 of the International Building Code regarding fire-resistance-rated construction. The following approval listings/test reports shall be available upon request for submission to the Authority Having Jurisdiction:

- a. ASTM E119: Panels shall have successfully passed the requirements of this standard when installed according to listed assembly.
- b. CAN/ULC-S101: Panels shall have successfully passed the requirements of this standard when installed according to listed assembly.
- c. CAN/ULC-S115: Panel penetrations shall have successfully passed the requirements of this standard when installed according to listed assembly.

C. Panel Description:

1. Panel thickness: [4 inches] [6 inches] [8 inches] thick.
2. Panel width: 42 inches.
3. Fire Rating: [1 hour] [2 hour] [3 hour].
4. Panel joint: Tongue and groove interlock joint.
5. Reveal: 1/8 inch, 3/8 inch
6. Exterior Face of Panel:

a. Material:

- 1) Steel coil material shall be in accordance with ASTM A755 ,Grade 33,[G90 galvanized steel in accordance with ASTM A653 and A924] [AZ50 Galvalume®/ Zinalume® (55% aluminum, 45% zinc) in accordance with ASTM A792], [Type 304 Stainless Steel].

b. Profile: [Shadowline].

- 1) Profile description: Linear striations nominal 0.0625 inch deep by 3/4 inches wide at 3 inches on center.
- 2) Texture: [Non-directional stucco embossed] [Smooth].
- 3) Gauge: [26] [24] [22].

OR

c. Profile: [Flat].

- 1) Profile description: Flat (unprofiled)
- 2) Texture: [Non-directional stucco embossed] [Smooth].
- 3) Gauge: [24] [22]

d. Profile: [Micro-Rib].

- 1) Profile description: Micro-Rib profile has linear 0.0625 inch deep fluted striations at 3/4 inches on center.
- 2) Texture: [Non-directional stucco embossed] [Smooth].
- 3) Gauge: [24] [22]

e. Profile: [Mini Micro-Rib].

- 1) Profile description: Mini Micro-Rib profile has linear 0.040 inch deep fluted striations at 5/16 inches on center.
- 2) Texture: [Smooth].
- 3) Gauge: [24]

f. Profile: [Azteco].

- 1) Profile description: Azteco profile is flat.
- 2) Texture: Heavy (deeply) embossed.
- 3) Gauge: [24] [22]

- g. Color: [Selected from the current Kingspan Insulated Panels stock color chart] [Custom color as selected by Architect] [Color indicated].

7. Interior Face of Panel:

a. Material:

- 1) Steel coil material shall be in accordance with ASTM A755 ,Grade 33,[G90 galvanized steel in accordance with ASTM A653 and A924] [AZ50 Galvalume®/ Zinalume® (55% aluminum, 45% zinc) in accordance with ASTM A792], [Type 304 Stainless Steel].
- 2) Profile: [Shadowline]
 - b. Texture: [Non-directional stucco embossed] [Smooth].
 - c. Gauge: [26] [24] [22].
 - d. Interior Finish: [modified polyester, dry film thickness of 1.0 mil including primer.] [PVDF finish, dry film thickness of 1.0 mil including primer] [Vinyl Plastisol, 4.0 mil including primer].
 - e. Profile: [Flat].
- 1) Profile description: Flat (unprofiled)
- 2) Texture: [Non-directional stucco embossed] [Smooth].
- 3) Gauge: [24] [22].
- 4) Color: [USDA Imperial White] [Selected from the current Kingspan Insulated Panels stock color chart] [same as exterior finish] [Custom color as selected by Architect] [Color indicated].

8. Insulating Core: Rigid mineral wool insulation board, bonded with a thermal setting resin in accordance with ASTM C612.

2.3 ACCESSORIES

A. Fasteners:

- 1. [Exposed through-fasteners applied from the exterior side of the panel connecting both metal faces to supporting steel structure.]
- 2. [Hidden fasteners with clips applied from the exterior and concealed in the panel side joint connecting both metal faces to supporting steel structure.]
- 3. Material: Hex-head type with steel and neoprene washer and 12 gauge stainless steel clip supplied by the manufacturer.
- 4. Size: As recommended by manufacturer.

- B. Perimeter Trim: Required trim and metal flashing shall be steel with same coating, color, and gauge as the exterior face of the insulated metal wall panel.

- C. Sealants: [Butyl, non-skinning/curing] [Silicone, mildew resistant] Kingspan SAFIRE Intumescent Mastic (per Kingspan K-Roc standard details) or type per panels manufacturer's recommendations

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Provide field measurements to manufacturer as required to achieve proper fit of the preformed wall panel envelope. Measurements shall be provided in a timely manner so that there is no impact to construction or manufacturing schedule.
- B. Supporting Steel: All structural supports required for installation of panels shall be by others. Support members shall be installed within the following tolerances:
 - 1. Plus or minus 1/8 inch in 5 feet in any direction along plane of framing.
 - 2. Plus or minus a cumulative of ¼ inch in 20 feet in any direction along plane of framing.
 - 3. Plus or minus ½ inch from framing plane on any elevation.
 - 4. Verify that bearing support has been provided behind vertical joints of horizontal panel systems and horizontal joints of vertical panel systems. Width of support shall be as recommended by manufacturer.
- C. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.
- D. Beginning of installation means acceptance of structure and supports for the installation of the insulated metal wall panels.

3.2 PANEL INSTALLATION

- A. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
- B. Install panels plumb, level, and true-to-line to dimensions and layout indicated on approved shop drawings.
- C. Cut panels prior to installing, where indicated on shop drawings, using a power circular saw with fine tooth carbide tip blade per manufacturer's instructions. Personnel should wear respiratory and eye protection devices.
- D. Apply [non-skinning butyl sealant] [silicone sealant] and Safire Intumescent Mastic as shown on shop drawings and manufacturer's installation instructions so as to complete the necessary vapor barrier.
- E. Place panel fasteners through pre-punched holes in attachment clips, concealed within the joint of the panel. Space clips as recommended by manufacturer or otherwise indicated on the approved shop drawings.
 - 1. Secure units to the steel supports with manufacturer's recommended fastener. Adjacent panels shall be mechanically interlocked at their longitudinal edges with the roll-formed tongue and groove profile.
 - 2. Install horizontal panels from bottom to top. Place female side of bottom panel in base channel, clip and fasten to structural supports.
 - 3. Install vertical panels from one end of the wall to the other end. Place the female panel end in base, fasten to structural supports.

3.3 TRIM INSTALLATION

- A. Place trim and trim fasteners only as indicated per details on the approved shop drawings.

- B. Field drill weep holes where appropriate in horizontal trim where indicated on shop drawings.
- C. Place a continuous strip of butyl tape or butyl sealant on closure trims for the length of the panel to be covered as indicated on shop drawings.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: General Contractor shall engage an independent testing and inspection agency acceptable to the architect to perform field tests and inspections and to prepare reports of findings.
- B. Field Water Test: After completing portion of metal wall panel assembly including accessories and trim, test a 2-bay area selected by the architect for water penetration in accordance with AAMA 501.2.

3.5 CLEANING AND PROTECTION

- A. Remove protective film immediately after installation.
- B. Touch-up, repair or replace metal panels and trim that have been damaged.
- C. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

END OF SECTION

DISCLAIMER:

Kingspan Insulated Panels Guide Specifications have been written as an aid to the professionally qualified Specifier and Design Professional. The use of this Guideline Specification requires the sole professional judgment and expertise of the qualified Specifier and Design Professional to adapt the information to the specific needs for the Building Owner and the Project, to coordinate with their Construction Document Process, and to meet all the applicable building codes, regulations and laws. KINGSPAN INSULATED PANELS EXPRESSLY DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OF THIS PRODUCT FOR THE PROJECT.