Part 1 General

1.1 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM A792: Standard Specification for Steel Sheet, 55 percent Aluminum-Zinc Alloy-Coated by the Hot–Dip Process.

.2 ASTM C165: Standard Test Method for Measuring Compressive Properties of Thermal Insulations.

.3 ASTM C303: Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation.

.4 ASTM C518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

.5 ASTM C612: Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

6 ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.

.7 ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.

.8 ASTM E136: Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C.

.9 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.

.10 ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

.11 ASTM E814: Standard Test Method for Fire Tests of Penetration Firestop Systems.

1.2 SYSTEM DESCRIPTION

.1 Design Requirements

.1 Design metal roof to provide for thermal movement of component materials without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

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.2 Include expansion joints to accommodate movement in roof system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.

.3 Design members to withstand all dead loads and climatic loads calculated in accordance with the National Building Code of Canada (NBCC) and applicable local regulations, to maximum allowable deflection of 1/240th of span.

.4 The panels shall be designed to resist all NBCC post-disaster loading requirements in accordance with the climatic data provided on the Drawings.

.5 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with National Research Council (NRC) "Rain Screen Principles".

1.2 SUBMITTALS

.1 Submit submittals in accordance with the Specifications.

.2 Product Data: Submit manufacturer's printed product literature, specifications and datasheets for each type of product.

.3 Shop Drawings:

.1 Submit detailed drawings and panel analysis 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 plans 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

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.4 Panel Analysis: Provide panel calculations to indicate compliance with maximum deflection of 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.

.5 Samples: Provide nominal 75 x 125 mm of each color indicated. Provide panel width by 250 mm long minimum.

.6 Manufacturer's 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.

1.3 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Manufacturer shall have a minimum of five (5) years' experience in the production of insulated wall panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.

.2 Installer Qualifications: Authorized by the manufacturer and the work shall be supervised by a person having a minimum of five (5) years' experience installing insulated wall panels on similar type and size projects.

.3 Pre-installation meeting: Conduct a pre-installation meeting at the job site attended by the City, Contract Administrator, Manufacturer's Technical Representative, Panel Installer, and Contractors of related trades. Coordinate structural support requirements in relation to insulated roof panel system, installation of any separate air/water barriers, and other requirements specific to the project.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.

.2 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.

.3 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.

Part 2 Products

2.1 MANUFACTURER

.1 Kingspan Insulated Panels Ltd.

.2 KS42 MF Series Insulated Wall Panels

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2.2 EXTERIOR WALL PANELS

.1 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/240.

.2 Fatigue Test: There shall be no evidence of metal/insulation interface delamination when the panel is tested by simulated wind loads (positive and negative loads), when applied for two million alternate cycles of L/240 deflection.

.3 Thermal Properties: The panel shall provide an R-value of 4.2 per inch thickness when tested in accordance with ASTM C518.

.4 Adhesion Test: Tensile strength in accordance with ASTM D1623.

.5 Penetration and Firestop Test: The finished panel with 4 inches and 6 inches thick mineral wool core and steel skins with through penetration firestop systems meet requirements of 1 hour and 2 hour fire resistance performance in accordance with ASTM E814 and UL 1479.

.6 Water Penetration: There shall be no uncontrolled water penetration through the panel joints at a pressure differential of 20 psf, when tested in accordance with ASTM E331.

.7 Air Infiltration: Air infiltration through the panel shall not exceed 0.001 cfm/sf at 20 psf air pressure differential when tested in accordance with ASTM E283.

.8 Insulating Core:

.1 Density: 8.5 lb. /cu. ft. +/- 10% or minimum 7.65 lb. /cu. ft., maximum 9.4 lb. / cu. ft.; in accordance with ASTM C303.

.2 Combustibility: Non-combustible at 1382º F in accordance with ASTM E136.

.3 Combustibility: Non-combustible when tested in accordance with ULC-S114, Flame Spread = 0, Smoke Developed = 0.

.4 Apparent thermal conductivity: Maximum “k” factor at 75º F. mean temp. - 0.24 Btu in/h ft2 ºF (R=4.2 ft2 ºF h / Btu inch thickness) in accordance with ASTM C518.

.5 Compressive Strength: Force applied parallel to fiber orientation (cut lamella pieces) Maximum 5% deformation at 9.2 KN of force in accordance with ASTM C165.

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.6 Dimensional stability: Linear shrinkage 2% max. at 1200º F in accordance with ASTM C612.

.7 Moisture resistance: Water vapor absorption - 5% max. by weight in accordance with ASTM C612.

.8 Odor emission: No objectionable odor in accordance with ASTM C612.

.9 CAN/ULC-S101: Panels shall have successfully passed the requirements of this standard.

.10 CAN/ULC-S115: Panel penetrations shall have successfully passed the requirements of this standard.

.2 Panel description:

.1 Panel thickness: 4 inches thick.

.2 Panel width: 40 inches.

.3 Panel joint: Tongue and groove interlock joint..

.4 Reveal: 1/8 inch.

.5 Exterior Face of Panel:

.1 Material: Steel coil material shall be in accordance with ASTM A755: AZ50 Galvalume®/ Zincalume® (55 percent aluminum, 45 percent zinc) in accordance with ASTM A792.

.6 Profile: Micro-Rib

.1 Profile description: Micro-Rib profile has linear 0.0625 inch deep fluted striations at ¾ inches on center.

.2 Texture: Non-directional stucco embossed

.3 Gauge: 24.

.7 Exterior Finish:

.1 1.0 mil. Fluropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70%) SOLID color coat

.2 Color: Dove Gray (Category 2)

.8 Interior face of panel:

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.1 Material: Steel coil material shall be in accordance with ASTM A755: AZ50 Galvalume®/ Zincalume® (55 percent aluminum, 45 percent zinc) in accordance with ASTM A792.

.2 Interior finish: modified polyester (MP), dry film thickness of 1.0 mil including primer

.1 Color: Imperial White

.9 Fasteners

.1 Exposed through-fasteners applied from the exterior side of the panel connecting both metal faces to supporting steel structure.

.2 Material: Hex-head type with steel and neoprene washer and 12 gauge stainless steel clip supplied by the manufacturer.

.3 Size: As recommended by manufacturer.

.4 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.

.5 Sealants: Butyl, non-skinning/curing, Silicone type per panels manufacturer’s recommendations.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 PREPARATION

.1 Protect metal surfaces in contact with concrete, masonry mortar, plaster or other cementitious surface with isolation coating.

3.3 INSTALLATION

.1 Install supporting steel to Section 05 55 00.

.2 Provide alignment bars, brackets, clips, inserts, shims as required to securely and permanently fasten wall system to building structure.

.3 Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.

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3.4 PANEL INSTALLATION

.1 Installation shall be in accordance with manufacturer's installation guidelines and recommendations.

.2 Install panels plumb, level, and true-to-line to dimensions and layout indicated on approved Shop Drawings.

.3 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.

.4 Apply non-skinning butyl sealant,[silicone sealant as shown on Shop Drawings and manufacturer's installation instructions so as to complete the necessary vapor barrier.

.5 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.

.6 Secure units with manufacturer's recommended fastener. Adjacent panels shall be mechanically interlocked at their longitudinal edges with the roll-formed tongue and groove profile.

.7 Install vertical panels from one end of the wall to the other end. Place the female panel end in base, fasten to structural supports.

3.5 TRIM INSTALLATION

.1 Place trim, expansion joint covers and fasteners only as indicated per details on the approved shop drawings.

.2 Place a continuous strip of butyl tube sealant between the inside back face of closure trims and interior panel faces of panels for proper vapor seal.

3.6 FIELD QUALITY CONTROL

.1 Testing Agency: General Contractor shall engage an independent testing and inspection agency acceptable to the Contract Administrator to perform field tests and inspections and to prepare reports of findings.

.2 Testing under Cash Allowance

3.7 CLEANING AND PROTECTION

.1 Touch-up, repair or replace metal panels and trim that have been damaged.

.2 Perform cleaning after installation to remove construction and accumulated environmental dirt.

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.3 Wash down exposed interior and exterior surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final clean-up.

.4 Remove excess sealant with recommended solvent.

.5 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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