SECTION 07 42 13

METAL WALL PANELS

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\*\* NOTE TO SPECIFIER \*\* Kingspan; Insulated metal panels.  
This section is based on the products of Kingspan, which is located at:726 Summerhill Dr.Deland, FL 32724 Toll Free Tel: 877-638-3266Tel: 386-626-6789Email: [request info (info.na@kingspanpanels.com)](https://arcat.com/rfi?action=email&company=Kingspan&message=RE%253A%2520Spec%2520Question%2520(07410ksp)%253A%2520&coid=31503&spec=07410ksp&rep=&fax=)  
Web: <https://www.kingspan.com/us/en-us> | <https://www.kingspan.com/ca/en-ca>   
 [ [Click Here](https://arcat.com/company/kingspan-31503) ] for additional information.  
The Kingspan Group was founded in 1972 as a small family business in the Republic of Ireland. The Group was initially involved in manufacturing metal cladding and roll-formed structural sections. During the early 80s and 90s, the Kingspan Group expanded into manufacturing insulated panels and insulation products, and established manufacturing plants in the U.K., Ireland and throughout Europe. Kingspan entered the North American market in 2007, and in a few short years became the largest volume seller on the continent. Today we reach a global market, with manufacturing, distribution and commercial operations throughout Europe, the United States, Australia, New Zealand, and the Far East.  
This guide is for insulated exterior wall panels composed of polyisocyanurate insulation factory laminated between two metal facings. This panel is designed to reduce the time required for installation by providing a single component assembly that provides the exterior weather barrier, high efficiency insulating core and an integral vapor barrier all-in-one. This panel offers energy cost savings through high R values and superior air and weathertightness.

1. GENERAL
   1. SECTION INCLUDES
      1. Laminated insulated galvanized steel or galvalume exterior metal wall panels. (Designwall 2000 Flat Panel) (Designwall 2000S Striated Panel)
      2. Foamed-in-Place steel, insulated metal wall panels. (Designwall 4000 Flat Panel) (Designwall 4000S Striated Panel)
      3. Accessories including fasteners and perimeter trim.
   2. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 05 10 00 - Structural Metal Framing.
    2. Section 05 40 00 - Cold-Formed Metal Framing.
    3. Section 07 21 19 - Foamed-In-Place Insulation.
    4. Section 07 27 00 - Air Barriers.
    5. Section 07 60 00 - Flashing and Sheet Metal.
    6. Section 07 90 00 - Joint Protection.
    7. Section 09 28 13 - Cementitious Backing Boards.
    8. Section 08 90 00 - Louvers and Vents.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Architectural Manufacturers Association (AAMA):
       1. AAMA 501.1: Standard Test Method for Metal Curtain Walls for water penetration using Dynamic Pressure.
       2. AAMA 501.2: Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
       3. AAMA 501.4: Recommended Static Test Method for Evaluating Window Wall, Curtain Wall, and Storefront Systems Subjected to Seismic and Wind-Induced Inter-Story Drift.
       4. AAMA 621: Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.
       5. AAMA 809.2: Voluntary Specification for Non-Drying Sealants.
    2. American Society of Civil Engineers (ASCE):
       1. ASCE 7: Minimum Design Loads for Buildings and Other Structures.
    3. ASTM International (ASTM):
       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 percent 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 B117: Standard Practice for Operating Salt Spray (Fog) Apparatus
       6. ASTM C272: Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions.
       7. ASTM C273: Standard Test Method for Shear Properties of Sandwich Core Materials.
       8. ASTM C591: Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
       9. ASTM C920: Standard Specification for Elastomeric Joint Sealants.
       10. ASTM D522: Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
       11. ASTM D523: Standard Test Method for Specular Gloss.
       12. ASTM D714: Standard Test Method for Evaluating Degree of Blistering of Paints.
       13. ASTM D968: Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
       14. ASTM D1308: Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
       15. ASTM D1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
       16. ASTM D1622: Standard test Method for Apparent Density of Rigid Cellular Plastics.
       17. ASTM D1623: Standard Test Method for Tensile and Tensile Adhesion of Rigid Cellular Plastics.
       18. ASTM D1929: Standard Test Method for Determining Ignition Temperature of Plastics.
       19. ASTM D2244: Standard practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
       20. ASTM D2247: Standard Practice for Testing Water Resistance of Coatings in 100 percent Relative Humidity.
       21. ASTM D2794: Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
       22. ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
       23. ASTM D3359: Standard Test Methods for Measuring Adhesion by Tape Test.
       24. ASTM D3363: Standard Test Method for Film Hardness by Pencil Test.
       25. ASTM D4145: Standard Test Method for Coating Flexibility of Prepainted Sheet.
       26. ASTM D4214: Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
       27. ASTM D5894: Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV Condensation Cabinet).
       28. ASTM D6226: Standard Test Method for Open Cell Content of Rigid Cellular Plastics.
       29. ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
       30. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials.
       31. 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.
       32. ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, Curtain Walls by Uniform Static Air pressure Difference.
       33. ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
       34. 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.
       35. ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates.
       36. ASTM F1642: Standard Test Method for Glazing Systems Subject to Airblast Loadings.
       37. ASTM G153: Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials.
       38. ASTM G154: Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.
    4. FM Global:
       1. FM 4880: Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Exterior Wall Systems.
       2. FM 4881: Approval Standard for Class 1 Exterior Wall Systems.
       3. FM 4882: Approval Standard for Class 1 Interior Wall and Ceiling Materials or Systems for Smoke Sensitive Occupancies
    5. Governmental Agencies:
       1. General Services Administration (GSA): GSA-TS01 - US General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings
       2. Department of Defense (DoD): UFC 4-010-01 - Unified Facilities Criteria (UFC) DoD Minimum Antiterrorism Standards for Buildings.
       3. Department of Veterans Affairs (VA): Physical Security Design Manual for VA Facilities (Life-Safety Protected).
    6. International Building Code (IBC): current edition:
    7. National Fire Protection Association (NFPA):
       1. NFPA 268: Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source.
       2. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-bearing Wall Assemblies Containing Combustible Components.

\*\* NOTE TO SPECIFIER \*\* Delete Florida Building Code reference standards paragraph when not required.

* + 1. Florida Building Code - Current Edition:
       1. Testing Application Standard (TAS) 201: Impact Test Procedures.
       2. Testing Application Standard (TAS) 202: Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure.
       3. Test Application Standard (TAS) 203: Criteria for Testing Products subject to Cyclic Wind Pressure Loading.
    2. City of Los Angeles (LARR):
       1. LARR Research Report Nos. RR26046 and RR26087.
    3. Underwriters Laboratories (UL).
       1. UL Canada (ULC)Approval:
          1. CAN/ULC-S101: Standard Methods of Fire Endurance Tests of Building Construction and Materials.
          2. CAN/ULC-S102: Surface Burning Characteristics of Building Materials and Assemblies.
          3. CAN/ULC-S134: Standard Method of Fire Test of Exterior Wall Assemblies.
          4. CAN/ULC-S138: Standard Method of Test for Fire Growth of Insulated Building Panels in a Full-Scale Room Configuration.
    4. International Organization for Standardization (ISO):
       1. ISO 14025: Environmental Labels and Declarations.
  1. SUBMITTALS

\*\* NOTE TO SPECIFIER \*\* Delete Submittal Procedures paragraph when not required. Coordinate requirements with Division 01, Section 01 33 00 - Submittal Procedures.

* + 1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
    2. Product Data: Submit manufacturer current technical literature for each type of product.
       1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with requirements.
       2. Preparation instructions and recommendations.
       3. Storage and handling requirements and recommendations.
       4. Installation methods.
    3. 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.
    4. Panel Analysis: Provide panel calculations to verify panels will withstand the design wind loads indicated without detrimental effects or deflection exceeding the specified limit. Include effects of thermal differential between the exterior and interior panel facings and resistance to fastener pullout.
    5. Verification Samples:

\*\* NOTE TO SPECIFIER \*\* Delete paragraph options below not required.

* + - 1. Nominal 3 x 5 inch (76 x 127 mm) of each color indicated.
      2. Provide panel width by 10 inches (254 mm) long minimum
      3. Panel Size: \_\_\_ inches (\_\_\_ mm).

\*\* NOTE TO SPECIFIER \*\* Specifier Note: N.O.A. documentation may be required for projects located in High Velocity Hurricane Zones. Delete paragraph if not applicable or when proprietary specification is written using Designwall0 and Designwall 4000.

* + 1. Submit N.O.A. documentation that manufacturer has been accepted and insulated metal panels are rated for use in High Velocity Hurricane Zone by Miami-Dade County, Florida.

\*\* NOTE TO SPECIFIER \*\* Specifier Note: Documentation of Blast Load resistance may be required on certain mission critical facilities as required by the Department of Defense (DoD) Minimum Anti-Terrorism Standards for Buildings, or by the Physical Security Design Manual for VA Facilities (Life-Safety Protected) Delete paragraph if not applicable.

* + 1. Anti-Terrorism/Force Protection: Submit documentation that panel system installed on metal studs will comply with the following:
       1. DoD UFC 4-010-01 Low level of protection for Conventional Construction stand-off distance with a "No Hazard" rating as established by ASTM F1642.
       2. GSA Level C and Performance Condition "2" rating.
       3. Veterans Administration criteria for Life-Safety Protected Facilities and a pressure impulse not exceeding GP1.
    2. Submit City of Los Angeles LARR report documenting that panel system as installed is approved for use in the City of Los Angeles.

\*\* NOTE TO SPECIFIER \*\* Delete LEED submittal requirements when project is not pursuing LEED certification. Related to Innovation and Design process (ID) credits; contact Kingspan for assistance in developing credits where their products can assist in obtaining. Submittal recommendations for LEED 2009, LEED v4, LEED,

* + 1. LEED V4 Submittals:
       1. Energy and Atmosphere:
          1. Energy Analysis: Demonstrating percentage of performance improvement compared with the baseline building performance rating.
       2. Materials and Resources: Building Life-Cycle Impact Reduction.
       3. Building Product Disclosure and Optimization:
          1. Environmental Product Declaration (EPD) conforming to ISO 14025, 14040, 14044, EN 15804 or ISO 21930 with a Cradle to Grave.
          2. Sourcing of Raw Materials: Publicly released reports that comply with LEED requirements for raw material source and extraction reporting.
       4. Indoor Environmental Quality:
          1. Low Emitting Materials: Compliance sheets indicating adhesives and gasket are within the published VOC emissions thresholds.
       5. Innovation in Design:
          1. Documentation for Credit: [Include specific requirements related to documenting credit.
    2. Miscellaneous Certifications:
       1. Submit documentation certifying that products comply with provisions of the "Buy American Act"Title 41 of the US Code Sub-sections 10a through 10d.
       2. Submit documentation that products have been certified in accordance with ISO 14025.
    3. Quality Assurance Submittals:

\*\* NOTE TO SPECIFIER \*\* Delete Design Data, Test Report submittal requirements when a proprietary specification is used. MAINTAIN Design Data, Test Report submittal requirement when other products may be submitted as substitutions.

* + - 1. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with requirements.
         1. Provide test report from nationally recognized testing agency to demonstrate compliance with IBC Section 1403.2.
      2. Manufacturer Erection Instructions: Provide manufacturer's written installation instructions including proper material storage, material handling, and maintenance instructions.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications:
        1. Manufacturer shall have a minimum of five (5) years' experience in the production of insulated metal wall panels. Manufacturer shall demonstrate experience with examples of projects of similar type and exposure.
        2. Manufacturer to be registered with a Program Operator with a Certified Environmental Product Declaration, in conformance with ISO 14025, for Insulated Metal Panels.
     2. Installer Qualifications: 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.
  2. PRE-INSTALLATION MEETINGS
     1. Pre-installation meeting: Conduct a pre-installation meeting at the job site attended by Owner, Architect, Manufacturer's Technical Representative, Panel Installer, and Contractors of related trades. Coordinate structural support requirements in relation to insulated wall panel system, installation of any separate air/water barriers, treatment of fenestration, and other requirements specific to the project.
  3. DELIVERY, STORAGE AND HANDLING

\*\* NOTE TO SPECIFIER \*\* DELETE Product Requirement paragraph when not required. Coordinate requirements with Division 01, Section 01 60 00 - Product Requirements.)

* + 1. Refer to Section 01 60 00 - Product Requirements.
    2. Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.
    3. 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.
  1. PROJECT CONDITIONS
     1. 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 recommended limits.
  2. SEQUENCING
     1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
  3. WARRANTY
     1. 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 include structural performance including bond integrity, deflection and buckling.
        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.

\*\* NOTE TO SPECIFIER \*\* Specifier Note: Finish warranty periods are limited by the coil coater and the coating manufacturer and the finish.

* + 1. Finish Warranty: Standard form in which manufacturer agrees to repair or replace metal panels that evidence deterioration of fluoropolymer finish, including flaking or peeling from approved primed metal substrate, chalk in excess of 8 when tested in accordance with ASTM D4214, Method A, and/or color fading in excess of 5 DELTA\_SYMBOLE Hunter units on panels when tested in accordance with ASTM D2244.
       1. Warranty Period: Twenty (20) years from date of Substantial Completion, or 20 years and 6 months from the date of shipment from manufacturer's plant, whichever occurs first.

1. PRODUCTS

\*\* NOTE TO SPECIFIER \*\* Specifier Note: Product Information is proprietary to Kingspan Insulated Panels. If additional products are required for competitive procurement, contact Kingspan Insulated Panels for assistance.

* 1. MANUFACTURER
     1. Kingspan BENCHMARK; a division of Kingspan Insulated Panels, Inc. which is located at: 720 Marion Road, Columbus, Ohio 43207; Toll Free: 1-877-638-3266; Tel: 614-444-0110; Email: info@kingspanpanels.us; Web: www.kingspanpanels.us
     2. Kingspan BENCHMARK; a division of Kingspan Insulated Panels, Inc. which is located at: 2000 Morgan Road, Modesto, California 95358; Toll Free: 1-800-377-5110 Tel: 209-531-9091; Email: info@kingspanpanels.us; Web: www.kingspanpanels.us
     3. Basis of Design:

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

* + - 1. Designwall 2000 Flat Panel
      2. Designwall 2000S Striated Panel
      3. Designwall 4000 Flat Panel
      4. Designwall 4000S Striated Panel
    1. Substitution Limitations:

\*\* NOTE TO SPECIFIER \*\* Delete substitution request submittal option not required.

* + - 1. Substitution Request Submittal: Written request for approval to the Architect a minimum of 14 days prior to date for receipt of bids.
      2. Substitution Request Submittal: Written request for approval to the Architect a minimum of \_\_\_\_ days prior to date for receipt of bids.
      3. Include the following information:
         1. Name of the materials and description of the proposed substitute.
         2. Drawings, cut sheets, performance, and test data.
         3. List of projects of similar scope and photographs of existing installations.
         4. Test reports indicating compliance with the performance criteria.
         5. Other information necessary for evaluation.
      4. After evaluation by Architect, approval will be issued via addendum. No verbal approval will be given.
      5. Substitutions following award of contract are not allowed except as stipulated in Division 01 - General Requirements.
  1. EXTERIOR WALL PANELS - DESIGNWALL 2000 SERIES
     1. Design Criteria:

\*\* NOTE TO SPECIFIER \*\* Delete wind loads option not required.

* + - 1. Wind Loads: As indicated on Drawings.
      2. Wind Loads: Insert positive and negative loads (psf) for Components and Cladding Zones 4 and 5.

\*\* NOTE TO SPECIFIER \*\* Panel deflection of L/180 is manufacturer's standard. When other conditions dictate, deflection criteria may be different, insert appropriate criteria. Delete deflection criteria option not required.

* + - 1. Deflection criteria: L/180.
      2. Deflection criteria: \_\_\_\_\_\_\_\_.
    1. Performance Criteria:
       1. Structural Tests:
          1. Static: Structural performance shall be verifiable by witnessed structural testing for simulated wind loads in accordance with ASTM E72 or ASTM E330.
          2. Cyclic: Tested constructions meet the approval criteria of FM 4881 when installed as specified in the listing.
       2. Large Missile Impact with Cyclic Pressure: Panels to pass test standards TAS 201/203 Large Missile Impact with Cyclic inward and outward pressures to demonstrate suitability for High Velocity Hurricane Zone applications with windborne debris.

\*\* NOTE TO SPECIFIER \*\* Delete Blast Loads paragraph if not applicable.

* + - 1. Blast Loads: Panels installed on metal stud system shall be tested to withstand a minimum shock load of 6.8 psi (41.4 kPa) peak pressure and 46 psi-msec (289.6 kPa-msec) impulse pressure when tested in accordance with ASTM F1642 or GSA-TS01. After testing there shall be no debris, fragments, or components found in the witness chamber.
      2. Bond Strength: No delamination shall occur after 2-1/2 hours in a 2 psi (13.8 kPa) 218 degrees F (102.8 degrees C) autoclave.
      3. Water Penetration:
         1. Dynamic: There shall be no uncontrolled water leakage when tested in accordance with AAMA 501.1 at a pressure differential of 15 psf (718 Pa) (718 Pa).
         2. Static: No uncontrolled water leakage, when tested in accordance with ASTM E331.

Pressure Differential: 6.24 psf (299 Pa).

Pressure Differential: 20 psf (958 PA).

\*\* NOTE TO SPECIFIER \*\* Panel system must satisfy the requirements of IBCSection 1403.2 (Exterior Walls), for a wall panel to be considered as a weather-protective envelope it must be successfully tested per ASTM E331 for a period of 2 hours. Designwall 2000 satisfies this requirement. Panel systems unable to demonstrate this requirement will require a separate weather-resistive barrier installed behind the wall panel system to comply with code.

* + - * 1. Static: 2 hour Duration: Panel system shall demonstrate no water penetration when tested in accordance with ASTM E331 at 6.24 psf (299 Pa) pressure differential for a two (2) hour duration to satisfy International Building Code, Section 1403.2.
      1. Air Infiltration: Air infiltration through the panel shall not exceed 0.01 cfm/sf when tested in accordance with ASTM E283.
         1. Pressure Differential: 6.24 psf (299 Pa).
         2. Pressure Differential: 20 psf (958 PA).
      2. Water Absorption: No more than 0.47 percent water absorption by volume when a 12 x 12 inch (305 x 305 mm) laminated insulated metal wall panel sample is subjected to a 24-hour full water submersion in accordance with ASTM C272.
      3. Thermal Performance: Polyisocyanurate (ISO) core panels shall provide the following R-Values as tested in accordance with ASTM C518 at 75 degree F (.7 degrees C) mean temperature:

\*\* NOTE TO SPECIFIER \*\* Delete R values for panels not used on Project. R values are for Flat or ShadowLine Panel with 1/2 inch (13 mm) reveal.

* + - * 1. 2 inch (51 mm) Thick Flat: R is 11.6
        2. 2.5 inch (64 mm) Thick Flat: R is 14.5
        3. 3 inch (76 mm) Thick Flat: R is 17.4
        4. 4 inch (102 mm) Thick Flat: R is 23.2

\*\* NOTE TO SPECIFIER \*\* Delete characteristics that do not apply to project specific requirements.

* + - 1. Seismic Performance:
         1. Comply with ASCE 7, Section 13, "Seismic Design Requirements for Non-Structural Components".
         2. Test Panels per AAMA 501.4.

After a minimum 1 percent story height seismic racking, there shall be no water penetration at 15 psf (718 Pa) pressure differential and no structural failure at 60 psf (2.873 kPa) simulated wind pressure.

* + - * 1. Panels shall be hard-fastened to structure along one edge only such that lateral slippage between panels can occur in the event of seismic activity.
      1. Fire Test Response Characteristics:
         1. Steel-faced panels with polyisocyanurate (ISO) core shall fully comply with Chapter 26 of International Building Code regarding the use of Foam Plastic.
         2. The following tests shall be available upon request for submission to the Authority Having Jurisdiction:

\*\* NOTE TO SPECIFIER \*\* NFPA 286, UL1715, and UBC 26-3 are equivalent test standards for enclosed room fire test. FM Global notes UBC 26-3 to establish Class I rating per FM standard 4880.

FM 4880: Class I rated per FM Global, panels are approved for use without a thermal barrier and do not create a requirement for automatic sprinkler protection.

\*\* NOTE TO SPECIFIER \*\* NFPA 255, UL723, and ASTM E84 are equivalent test standards for surface burning characteristics.

Surface burning characteristics of unfaced foam core when tested in accordance with ASTM E84:

Flame Spread: Less than 25.

Smoke Developed: Less than 250.

NFPA 285 Intermediate Scale Multi-story Fire Evaluation; successfully passed acceptance criteria when installed per listed details.

\*\* NOTE TO SPECIFIER \*\* ASTM E119 and UL263 are equivalent test standards for fire resistive ratings.

NFPA 268 Exposure to a Radiant Heat Energy Source; successfully passed acceptance criteria.

ASTM D1929 Minimum Flash and Self Ignition; established for foam core.

NFPA 259 Potential Heat Content; established for foam core.

\*\* NOTE TO SPECIFIER \*\* Delete approvals that do not apply to project specific requirements.

* + - 1. Regional and International Approvals: Steel-faced panels with polyisocyanurate (ISO) foam core shall have the following specific approvals in-place:

\*\* NOTE TO SPECIFIER \*\* Miami-Dade N.O.A. number, Florida report number, and UL Canada file numbers are specific to Designwall 2000 product. If specification is non-proprietary revise paragraph to include N.O.A. documentation for manufacturer's listed.

* + - * 1. Miami-Dade County, Florida N.O.A. No. 22-0822.08 High Velocity Hurricane Zone Rated (expires May 18, 2027).
        2. Florida Product Approval: Report No. FL-31365.1, Florida Building Code for Non-Hurricane Zones.
        3. Code Compliance Evaluation Report: Intertek CCRR No. 1037.
        4. City of Los Angeles: LARR No. 26046.
      1. Insulating Core: Polyisocyanurate (ISO) core, ASTM C591 Type IV, CFC and HCFC free, compliant with Montreal Protocol and Clean Air Act, with the following minimum physical properties:
         1. Density Nominal per ASTM D1622: 2.0 pcf (32.04 kg per cu m).
         2. Shear Strength per ASTM C273: 21 psi (144.8 kPa).
         3. Compressive Strength per ASTM D1621: 25 psi (172.4 kPa).
         4. Tensile Strength: 36 psi (248.2 kPa).
         5. Closed Cell Content per ASTM D6226: 95 percent minimum
         6. FM Global approvals: Class 1 per FM 4880

\*\* NOTE TO SPECIFIER \*\* Choose appropriate exterior panel finish characteristics per project requirements.

* + 1. Exterior Paint Finish Characteristics for Panels meeting the requirements of AAMA 621 for G90 galvanized steel or AZ50 Galvalume:
       1. Gloss: 15 plus or minus 5 measured at 60 degree angle tested in accordance with ASTM D523.
       2. Pencil Hardness: HB-H minimum tested in accordance with ASTM D3363.
       3. Flexibility, T-Bend: 1-2T bend with no adhesion loss when tested in accordance with ASTM D4145.
       4. Flexibility, Mandrel: No cracking when bent 180 degrees around a 1/8 mandrel as tested in accordance with ASTM D522.
       5. Adhesion: No adhesion loss tested in accordance with ASTM D3359.
       6. Reverse Impact: No cracking or adhesion loss when impacted 3000 x inches of metal thickness (lb-in), tested in accordance with ASTM D2794.
       7. Abrasion Resistance: Nominal 65 liters of falling sand to expose 5/32 inch (4 mm) diameter of metal substrate when tested in accordance with ASTM D968.
       8. Graffiti Resistance: Minimal effect.
       9. Acid Pollutant Resistance: No effect when subjected to 30 percent sulfuric acid for 18 hours, or 10 percent muriatic acid for 15 minutes when tested in accordance with ASTM D1308.
       10. Salt Fog Resistance: Passes 1000 hours, when tested in accordance with ASTM B117; 5 percent salt fog at 95 degrees F (35 degrees C).
       11. Cyclic Salt Fog and UV Exposure: Passes 2016 hours when tested in accordance with ASTM D5894.
       12. Humidity Resistance: Passes 1500 hours at 100 percent relative humidity and 95 degrees F, with a test rating of 10 when tested in accordance with ASTM D2247 and D714.
       13. Color Retention: Passes 5000 hours when tested in accordance with ASTM G153 and G154.
       14. Chalk Resistance: Maximum chalk is a rating of 8 when tested in accordance with ASTM D4214, Method A.
       15. Color Tolerances: Maximum of 5DELTA\_SYMBOLEHunter units on panels when tested in accordance with ASTM D2244.
    2. Exterior Aggregate Finish Characteristics:
       1. Moisture Resistance: 14 days exposure with no deleterious effects when tested in accordance with ASTM D2247.
       2. Salt Spray: 1000 hours, no deleterious effects when tested in accordance with ASTM B117.
       3. Abrasion Resistance: 500 liters of sand, no deleterious effects when tested in accordance with ASTM D968.
       4. Freeze/Thaw (60 cycles): No checking, cracking, or splitting.
       5. Mold Resistance: No growth of mold when tested per ASTM D3273.
       6. Flame Spread: Less than 25, Class 1 rating when tested in accordance with ASTM E84.
    3. Panel Assembly:

\*\* NOTE TO SPECIFIER \*\* Panel thickness is directly related to R-value.

* + - 1. Panel thickness: 2 inches (51 mm) thick.
      2. Panel thickness: 2-1/2 inches (64 mm) thick.
      3. Panel thickness: 3 inches (76 mm) thick.
      4. Panel thickness: 4 inches (102 mm) thick.

\*\* NOTE TO SPECIFIER \*\* Choose appropriate panel width based on "Basis of Design" selection.)

* + - 1. Panel Width of Flat Panels and Striated Panels: 24 inches (610 mm).
      2. Panel Width of Flat Panels and Striated Panels: 30 inches (762 mm).
      3. Panel Width of Flat Panels and Striated Panels: 36 inches (914 mm).
      4. Panel Width of Flat Panels and Striated Panels: Custom.
      5. Panel Width of Flat Panels and Striated Panels: As indicated on drawings.
      6. Panel Joint: Consists of fasteners and attachment clip completely concealed within the joint.
         1. Two distinct lines of defense against water infiltration: Continuous finned rubber gasket seal on both face and liner sheet.
      7. Horizontal Panels: Nominal gutter height of 3-1/4 inches.(83 mm).
      8. Exterior Face of Panel:
         1. Coil Material: In accordance with ASTM A755.

\*\* NOTE TO SPECIFIER \*\* Delete Material and steel thickness options not required.

Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924.

AZ50 Galvalume / Zincalume in accordance with ASTM A792 (contact Kingspan for project specific availability).

Gauge: 22 (steel).

Gauge: 20 (steel).

\*\* NOTE TO SPECIFIER \*\* Delete profile option not required. Flat and Striated profile panels are available with various reveal widths. Standard reveal for horizontal panels is 1/2 inch (13 mm) wide. Standard reveal for vertical panels is a tight joint. Contact Kingspan for option reveal widths.

* + - * 1. Profile: Flat. No flutes, planking, or mild profiling of any type.

Reveal Width: As indicated on the Drawings.

* + - * 1. Profile: Striated. Linear striations nominal 0.035 inches (0.89 mm) deep, 2 at 5/8 inch (16 mm) equal to 1-1/4 inch (32 mm) o.c. across the entire face width.

Reveal Width: As indicated on the Drawings.

* + - * 1. Exterior Texture: Smooth.
        2. Exterior Texture: Non-directional embossed.

\*\* NOTE TO SPECIFIER \*\* Panels are available in a painted finish or aggregate finish. Select finish to meet project requirements.

* + - * 1. Exterior Paint Finish Color: Selected from current Kingspan Insulated Panels color chart.
        2. Exterior Paint Finish Color: Custom color as selected by the Architect.
        3. Exterior Paint Finish Color: Color indicated.
        4. Finish System:

\*\* NOTE TO SPECIFIER \*\* Choose one of the following paint systems. 1.0 mil Two Coat system(Solid Color) is most commonly used. Use the 2.4 mil Three Coat system if a harsh environment is anticipated (such as industrial facilities or in coastal regions). The 1.0 mil Mica color coat and the 1.5 mil Metallic color coat systems are chosen if Premium Colors are desired. The paint systems will receive the 20 year finish warranty.

Two Coat System: 1.0 mil. Fluropolymer (PVDF).

Primer: 0.2 mil. Kynar 500 (70 percent) Solid Color Coat: 0.8 mil.

Two Coat System: 1.0 mil. Fluropolymer (PVDF).

Primer: 0.2 mil. Kynar 500 (70 percent) MICA Color Coat: 0.8 mil.

Three Coat System: 1.5 mil. Fluropolymer (PVDF).

Primer: 0.2 mil. Kynar 500 (70 percent) METALLIC Color Coat: 0.8 mil. Clear Coat: .5

Three Coat System: 2.4 mil. Fluropolymer (PVDF). 0.8 mil primer with 0.8 mil Kynar 500 (70 percent) SOLID color coat and 0.8 mil clear coat.

Exterior Aggregate Finish:

\*\* NOTE TO SPECIFIER \*\* Silica Aggregate Colors are applied at 12 mils dry film thickness and Quartz Aggregate Colors are applied at 36 mils dry film thickness).

Baked epoxy primer with factory applied 12 mil dry film thickness finish coat of acrylic bonder and silica aggregate.

Baked epoxy primer with factory applied 36 mil dry film thickness finish coat of acrylic bonder and silica aggregate.

\*\* NOTE TO SPECIFIER \*\* Exterior aggregate finishes are typically formulated as earth-tone colors only. Micas or metallics are not available).

Silica Aggregate Color: Selected from current Kingspan Insulated Panels GRANITSTONE color chart.

Silica Aggregate Color: Custom color as selected by Architect.

Silica Aggregate Color: Color indicated.

Quartz Aggregate Color: Selected from current Kingspan Insulated Panels GRANITSTONE QUARTZ color chart.

Quartz Aggregate Color: Color indicated.

* + - 1. Interior Face of Panel:
         1. Coil Material: Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924
         2. Coil Material: AZ50 Galvalume / Zincalume in accordance with ASTM A792 (contact Kingspan for project specific availability).

\*\* NOTE TO SPECIFIER \*\* 24 gauge steel is standard.)

* + - * 1. Steel Gauge: 20.
        2. Steel Gauge: 22.
        3. Steel Gauge: 24.
        4. Profile: Standard flat, non-profiled.
        5. Texture: Smooth.
        6. Interior Finish: Modified polyester finish with a total minimum dry film thickness of 0.9 to 1.1 mil including primer.

\*\* NOTE TO SPECIFIER \*\* USDA Imperial White is standard color.

* + - * 1. Color: USDA Imperial White.
        2. Color: Selected from Kingspan Insulated Panels stock color chart.
        3. Color: Same as exterior finish.
        4. Color: Custom color as selected by Architect.
        5. Color: Color indicated.
      1. Insulating Core: Precured, profiled, sanded flat, and fully inspected prior to lamination. Core material shall be polyisocyanurate (ISO).
      2. Structural Adhesive: Type II Class 2 Structural Urethane Adhesive, 100 percent solids and 100 percent solvent free, evaluated and listed for sandwich panel construction by ICC Evaluation Service or other recognized agency.
  1. EXTERIOR WALL PANELS - DESIGNWALL 4000 SERIES
     1. Design Criteria:

\*\* NOTE TO SPECIFIER \*\* Delete wind loads option not required.

* + - 1. Wind Loads: As indicated on Drawings.
      2. Wind Loads: Insert positive and negative loads (psf) for Components and Cladding Zones 4 and 5.

\*\* NOTE TO SPECIFIER \*\* Panel deflection of L/180 is manufacturer's standard. When other conditions dictate, deflection criteria may be different, insert appropriate criteria. Delete deflection criteria option not required.

* + - 1. Deflection criteria: L/180.
      2. Deflection criteria: \_\_\_\_\_\_\_\_.
    1. Performance Criteria:
       1. Structural Test:
          1. Static: Structural performance shall be verifiable by witnessed structural testing for simulated wind loads in accordance with ASTM E72 or ASTM E330.
          2. Cyclic: Tested constructions meet the approval criteria of FM 4881 when installed as specified in the listing.
       2. Large Missile Impact with Cyclic Pressure: Panels to pass test standards TAS 201/203 Large Missile Impact with Cyclic inward and outward pressures to demonstrate suitability for High Velocity Hurricane Zone applications with windborne debris.

\*\* NOTE TO SPECIFIER \*\* Delete Blast Loads paragraph if not applicable.

* + - 1. Blast Loads: Panels installed on metal stud system shall be tested to withstand a minimum shock load of 6.8 psi (41.4 kPa) peak pressure and 46 psi-msec (2089.6 kPa-msec) impulse pressure when tested in accordance with ASTM F1642 or GSA-TS01. After testing there shall be no debris, fragments, or components found in the witness chamber.
      2. Bond Strength: No metal primer interface corrosion and/or delamination is to occur after 1000 hours at 135 degrees F (57 degrees C) and 100 percent relative humidity. No delamination shall occur after 2-1/2 hours in a 2 psi (13.8 kPa) 218 degrees F (102.8 degrees C) autoclave.
      3. Water Penetration:
         1. Dynamic: There shall be no uncontrolled water leakage when tested in accordance with AAMA 501.1 at a pressure differential of 15 psf (718 Pa).
         2. Static: No uncontrolled water leakage, when tested in accordance with ASTM E331.

Pressure Differential: 6.24 psf (299 Pa).

Pressure Differential: 20 psf (958 PA).

\*\* NOTE TO SPECIFIER \*\* Panel system must satisfy the requirements of IBC 2006 Section 1403.2 (Exterior Walls), for a wall panel to be considered as a weather-protective envelope it must be successfully tested per ASTM E331 for a period of 2 hours. Designwall 4000 satisfies this requirement. Panel systems unable to demonstrate this requirement will require a separate weather-resistive barrier installed behind the wall panel system to comply with code.

* + - * 1. Static: 2 hour Duration: Panel system shall demonstrate no water penetration when tested in accordance with ASTM E331 at 6.24 psf (299 Pa) pressure differential for a two (2) hour duration to satisfy International Building Code, Section 1403.2.
      1. Air Infiltration: Air infiltration through the panel shall not exceed 0.01 cfm per sq ft when tested in accordance with ASTM E283.
         1. Pressure Differential: 6.24 psf (299 Pa).
         2. Pressure Differential: 20 psf (958 PA).
      2. Water Absorption: No more than 0.72 pcf water absorption based on 3 x 2 x 0.5 inch (76 x 51 x 13 mm) foamed-in-place insulated metal wall panel samples subjected to a 24-hour full water submersion in accordance with ASTM C272.
      3. Thermal Performance: QuadCore hybrid polyisocyanurate (POLYISO) panel core providing the following R-Values as tested in accordance with ASTM C518 at 75 degrees F (23.9 degrees C) mean temperature:

\*\* NOTE TO SPECIFIER \*\* Delete R values for panels not used on Project. R values are for Flat or ShadowLine Panel with 1/2 inch reveal.

* + - * 1. 2 inch (51 mm) thick Flat: R is 16.
        2. 2.5 inch (64 mm) thick Flat: R is 20.
        3. 3 inch (76 mm) thick Flat: R is 24.
        4. 4 inch (102 mm) thick Flat: R is 32.

\*\* NOTE TO SPECIFIER \*\* Delete characteristics that do not apply to project specific requirements.

* + - 1. Seismic Performance:
         1. Comply with ASCE 7, Section 13, "Seismic Design Requirements for Non-Structural Components".
         2. Test Panels per AAMA 501.4.

After a minimum 1 percent story height seismic racking, there shall be no water penetration at 15 psf (718 Pa) pressure differential and no structural failure at 60 psf (2.873 kPa) simulated wind pressure.

* + - * 1. Panels shall be hard-fastened to structure along one edge only such that lateral slippage between panels can occur in the event of seismic activity.
      1. Fire Test Response Characteristics:
         1. Steel-faced panels with QuadCore hybrid polyisocyanurate (POLYISO) core shall fully comply with Chapter 26 of International Building Code regarding the use of Foam Plastic.
         2. The following tests shall be available upon request for submission to the Authority Having Jurisdiction:

\*\* NOTE TO SPECIFIER \*\* NFPA 286, UL1715, and UBC 26-3 are equivalent test standards for enclosed room fire test FM Global notes UBC 26-3 to establish Class I rating per FM standard 4880.

FM 4880: Class I rated per FM Global, panels are approved for use without a thermal barrier and do not create a requirement for automatic sprinkler protection.

FM 4882: Class I rated per FM Global for smoke sensitive occupancies.

\*\* NOTE TO SPECIFIER \*\* NFPA 255, UL723, and ASTM E84 are equivalent test standards for surface burning characteristics.

Surface burning characteristics of unfaced foam core when tested in accordance with ASTM E84:

Flame Spread: Less than 25.

Smoke Developed: Less than 90.

NFPA 285 Intermediate Scale Multi-story Fire Evaluation; successfully passed acceptance criteria when installed per listed assemblies.

ASTM D1929 Minimum Flash and Self Ignition; established for foam core.

Self-Ignition: 1050 degrees F, minimum

Flash Ignition: 1030 degrees F, minimum

NFPA 259 Potential Heat Content; established for foam core: 12,063 BTU/lb.

CAN/ULC S102, S134, S138 fire test standards; successfully passed.

\*\* NOTE TO SPECIFIER \*\* Delete approvals that do not apply to project specific requirements.

* + - 1. Regional and International Approvals: Steel-faced panels with QuadCore hybrid polyisocyanurate (POLYISO) foam core shall have the following specific approvals in-place:

\*\* NOTE TO SPECIFIER \*\* Miami-Dade N.O.A. number, Florida report number, etc., are specific to Designwall 4000 product. If specification is non-proprietary revise paragraph to include N.O.A. documentation for manufacturer's listed.

* + - * 1. Miami-Dade County, Florida N.O.A. No. 22-0822.08 High Velocity Hurricane Zone Rated (expires May 18, 2027).
        2. Florida Product Approval: Report No. FL-31365.1, Florida Building Code for Non-Hurricane Zones.
        3. Code Compliance Evaluation Report: Intertek CCRR No. 1037.
        4. City of Los Angeles: LARR Research Report No. RR26087
      1. Insulating Core: QuadCore hybrid polyisocyanurate (POLYISO) foamed-in-place core, ASTM C591 Type IV, CFC and HCFC free, Halogenated Flame Retardant (HFR) free, compliant with Montreal Protocol and Clean Air Act, with the following minimum physical properties:
         1. Density Nominal per ASTM D1622: 2.4 pcf (38.44kg per cu m)
         2. Shear Strength per ASTM C273: 22 psi (151.7 kPa)
         3. Compressive Strength per ASTM C1621: 47 psi (324 kPa)
         4. Tensile Strength per ASTM D1623:21 psi (144.8 kPa)
         5. Closed Cell Content per ASTM D6226: 95 percent

\*\* NOTE TO SPECIFIER \*\* Choose appropriate exterior panel finish characteristics per project requirements.

* + 1. Exterior Paint Finish Characteristics for Panels meeting the requirements of AAMA 621 for G90 galvanized steel or AZ50 Galvalume :
       1. Gloss: 15 plus or minus 5 measured at 60 degree angle tested in accordance with ASTM D523.
       2. Pencil Hardness: HB-H minimum tested in accordance with ASTM D3363.
       3. Flexibility, T-Bend: 1-2T bend with no adhesion loss when tested in accordance with ASTM D4145.
       4. Flexibility, Mandrel: No cracking when bent 180 degrees around a 1/8 mandrel as tested in accordance with ASTM D522.
       5. Adhesion: No adhesion loss tested in accordance with ASTM D3359.
       6. Reverse Impact: No cracking or adhesion loss when impacted 3000 x inches of metal thickness (lb-in), tested in accordance with ASTM D2794.
       7. Abrasion Resistance: Nominal 65 liters of falling sand to expose 5/32 inch diameter of metal substrate when tested in accordance with ASTM D968.
       8. Graffiti Resistance: Minimal effect.
       9. Acid Pollutant Resistance: No effect when subjected to 30 percent sulfuric acid for 18 hours, or 10 percent muriatic acid for 15 minutes when tested in accordance with ASTM D1308.
       10. Salt Fog Resistance: Passes 1000 hours, when tested in accordance with ASTM B117; 5 percent salt fog at 95 degrees F (35 degrees C).
       11. Cyclic Salt Fog and UV Exposure: Passes 2016 hours when tested in accordance with ASTM D5894.
       12. Humidity Resistance: Passes 1500 hours at 100 percent relative humidity and 95 degrees F (35 degrees C), with a test rating of 10 when tested in accordance with ASTM D2247 and D714.
       13. Color Retention: Passes 5000 hours when tested in accordance with ASTM G153 and G154.
       14. Chalk Resistance: Maximum chalk is a rating of 8 when tested in accordance with ASTM D4214, Method A.
       15. Color Tolerances: Maximum of 5DELTA\_SYMBOLE Hunter units on panels when tested in accordance with ASTM D2244.
    2. Panel Assembly:

\*\* NOTE TO SPECIFIER \*\* Panel thickness is directly related to R-value.

* + - 1. Panel thickness: 2 inches (51 mm) thick.
      2. Panel thickness: 2-1/2 inches (64 mm) thick.
      3. Panel thickness: 3 inches (76 mm) thick.
      4. Panel thickness: 4 inches (102 mm) thick.

\*\* NOTE TO SPECIFIER \*\* Choose appropriate panel width based on "Basis of Design" selection.)

* + - 1. Panel Width of Flat Panels and Striated Panels: 24 inches (610).
      2. Panel Width of Flat Panels and Striated Panels: 30 inches (762).
      3. Panel Width of Flat Panels and Striated Panels: 36 inches (914).
      4. Panel Width of Flat Panels and Striated Panels: Custom.
      5. Panel Width of Flat Panels and Striated Panels: As indicated on drawings.
      6. Panel Joint: Consists of fasteners and attachment clip completely concealed within the joint.
         1. Two distinct lines of defense against water infiltration: Continuous finned rubber gasket seal on face and factory wet butyl seal on liner sheet.
      7. Horizontal Panels: Nominal gutter height of 3-1/4 inches.(83 mm).
      8. Exterior Face of Panel:
         1. Coin Material: In accordance with ASTM A755.

\*\* NOTE TO SPECIFIER \*\* Delete Material and steel thickness options not required.

Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924.

AZ50 Galvalume / Zincalume in accordance with ASTM A792 (contact Kingspan for project specific availability).

Steel Thickness: 22 ga.

Steel Thickness: 20 ga.

\*\* NOTE TO SPECIFIER \*\* Delete profile options and exterior texture option not required. Flat and Striated profile panels are available with various reveal widths. Standard reveal for horizontal panels is 1/2 inch (12 mm) wide. Standard reveal for vertical panels is a tight joint. Consult Kingspan for optional reveal widths.

* + - * 1. Profile: Flat. No flutes, planking, or mild profiling of any type.

Reveal width shall be as indicated on the Drawings.

* + - * 1. Profile: Striated. Linear striations nominal 0.035 inches deep, 2 at 3/8 inches equaling 3/4 inch o.c. across the entire face width

Reveal Width: As indicated on the Drawings

* + - * 1. Profile: Striated. Linear striations nominal 0.035 inches deep, 2 at 5/8 inches equaling 1-1/4 inch o.c. across the entire face width.

Reveal Width: As indicated on the Drawings

* + - * 1. Exterior Texture: Smooth.
        2. Exterior Texture: Non-directional embossed.

\*\* NOTE TO SPECIFIER \*\* Delete exterior paint finish color options not required.

* + - * 1. Exterior Paint Finish Color: Selected from current Kingspan Insulated Panels color chart.
        2. Exterior Paint Finish Color: Custom color as selected by Architect.
        3. Exterior Paint Finish Color: Color indicated.
        4. Finish System:

\*\* NOTE TO SPECIFIER \*\* Choose one of the following paint systems. 1.0 mil Two Coat system(Solid Color) is most commonly used. Use the 2.4 mil Three Coat system if a harsh environment is anticipated (such as industrial facilities or in coastal regions). The 1.0 mil Mica color coat and the 1.5 mil Metallic color coat systems are chosen if Premium Colors are desired. The paint systems will receive the 20 year finish warranty.

Two Coat System: 1.0 mil. Fluropolymer (PVDF).

Primer: 0.2 mil. Kynar 500 (70 percent) SOLID Color Coat: 0.8 mil.

Two Coat System: 1.0 mil. Fluropolymer (PVDF).

Primer: 0.2 mil. Kynar 500 (70 percent) MICA Color Coat: 0.8 mil.

Three Coat System: 1.5 mil. Fluropolymer (PVDF).

Primer: 0.2 mil. Kynar 500 (70 percent) METALLIC Color Coat: 0.8 mil. Clear Coat: .5.

Three Coat System: 2.4 mil. Fluropolymer (PVDF). 0.8 mil primer with 0.8 mil Kynar 500 (70 percent) SOLID color coat and 0.8 mil clear coat.

* + - 1. Interior Face of Panel:
         1. Coil Material: Grade 33, G90 galvanized steel in accordance with ASTM A653 and A924.

\*\* NOTE TO SPECIFIER \*\* Contact Kingspan for project specific availability.

* + - * 1. Coil Material: AZ50 Galvalume / Zincalume in accordance with ASTM A792.
        2. Steel Gauge: 24.
        3. Steel Gauge: 22.
        4. Profile: Standard flat, non-profiled.
        5. Texture: Smooth.
        6. Interior Finish: Modified polyester finish with a total minimum dry film thickness of 0.9 to 1.1 mil including primer.

\*\* NOTE TO SPECIFIER \*\* USDA Imperial White is standard color. Delete color options not required.

* + - * 1. Color: USDA Imperial White.
        2. Color: Selected from Kingspan Insulated Panels stock color chart.
        3. Color: Same as exterior finish.
        4. Color: Custom color as selected by Architect.
        5. Color: Color indicated.
      1. Insulating Core: QuadCore hybrid polyisocyanurate foamed-in-place during panel manufacture to a nominal in-place density of 2.4 pcf.
      2. Panel Construction: By ICC Evaluation Service or another recognized agency.
  1. ACCESSORIES

\*\* NOTE TO SPECIFIER \*\* Zinc plated carbon steel is the standard fastener.

* + 1. Fasteners: Fasteners as recommended by manufacturer.
    2. Clips: Minimum 14 gauge half-hard type 301 stainless steel with PVC or neoprene foam sealing pad adhered to underside of clip, designed to prevent water infiltration around fastener penetrations.
    3. Perimeter Trim:
       1. Fabricated Perimeter Trim and Metal Flashing: Same gauge, material, and coating color as exterior face of insulated metal wall panel.
       2. Extruded Perimeter Trim: Extruded aluminum 6063-T5 alloy with spray applied PVF coating in same color as exterior face of insulated metal wall panel.

\*\* NOTE TO SPECIFIER \*\* Butyl sealants are suitable for non-exposed application only. Non-exposed applications are those that are not-easily seen. Any sealants that may be required in exposed applications should be coordinated with adjacent materials.

* + 1. Butyl Weather Barrier Sealant: Non-skinning butyl tube sealant per panel manufacturer's recommendations compliant with AAMA 809.2.
    2. Vertical Joint: For horizontal panel applications.
       1. Material: Extruded Fire-Retardant TPE rubber gasket shall have a finned profile. Vertical joint gasket shall give the appearance of a recessed and tooled caulk joint and be capable of accommodating joint width variations from 3/8 to 3/4 inch due to normal construction tolerances.

\*\* NOTE TO SPECIFIER \*\* Delete color options not required.

* + - 1. Color: Standard Black gasket.
      2. Color: Standard Light Gray gasket.
      3. Color: Custom color gasket, non-metallic, to match panel color.

\*\* NOTE TO SPECIFIER \*\* Do not use acid cure or acidic based silicone sealants for exposed joints. Choose either the polyurethane or silicone and delete the option not required.

* + 1. Sealants at exposed joints: Compliant with ASTM C920.
       1. Elastomeric polyurethane.
       2. Neutral cure silicone.

1. EXECUTION
   1. EXAMINATION
      1. 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.
      2. 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 (3 mm) in 5 feet (1524 mm) in any direction along plane of framing.
         2. Plus or minus 1/4 inch (6 mm) cumulative in 20 feet (6096 mm) in any direction along plane of framing.
         3. Plus or minus 1/2 inch (13 mm) from framing plane on any elevation.
         4. Plumb or level within 1/8 inch (3 mm) at all changes of transverse for performed corner panel applications.
         5. 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.
      3. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.
   2. 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. Ventilate area where polyurethane dust is generated. Personnel should wear respiratory and eye protection devices.
      4. Butyl Weather Barrier Sealant:
         1. Apply non-skinning butyl sealant as shown on shop drawings and manufacturer's installation instructions as necessary to establish the vapor barrier for the panels.
         2. Use non-skinning butyl tube sealant only for tight metal-to-metal contact.
         3. Do not use non-skinning butyl tube sealant to bridge gaps.
      5. Place panel fasteners through pre-punched holes in attachment clips, concealed within the joint of the panel. Secure units to the structural supports. Space clips as recommended by manufacturer or otherwise indicated on the approved shop drawings.
   3. TRIM INSTALLATION
      1. Place trim and trim fasteners only as indicated per details on the approved shop drawings.
      2. Field drill weep holes where appropriate in horizontal trim; minimum 1/4 inch (6 mm) diameter at 24 inches (610 mm) on center.
      3. Place a continuous strip of butyl tape or butyl tube sealant on closure trims for the length of the panel to be covered by trim.
   4. SEALANT INSTALLATION FOR EXPOSED JOINTS
      1. Clean and prime surfaces to receive exterior exposed sealants in accordance with sealant manufacturer's recommendations.
      2. Follow sealant manufacturer's recommendations for joint width-to-depth ratio, application temperature range, size and type of backer rod, and compatibility of materials for adhesion.
      3. Direct contact between butyl and silicone sealants shall not be permitted.
   5. FIELD QUALITY CONTROL
      1. 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.
      2. 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 or ASTM E1105.
   6. CLEANING AND PROTECTION
      1. Remove protective film immediately after installation.
      2. Touch-up, repair or replace metal panels and trim that have been damaged.
      3. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

END OF SECTION