SECTION 074243 - COMPOSITE WALL PANELS

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Electron-beam cured high pressure laminate composite wall panel system assemblies.

Attachment components and accessories.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 054000 "Cold-Formed Metal Framing" for metal stud substrate support framing.

Section 061000 "Rough Carpentry" for wood stud substrate support framing.

Section 061600 "Sheathing" for wall sheathing substrates.

Section 072100 "Thermal Insulation" for continuous insulation behind exterior cladding.

Retain one of three Section references below for appropriate type of weather barrier or air barrier to be included in Project; delete Section references not used. The weather barrier or air barrier is a critical element of a continuous insulation (CI) wall assembly, and it is recommended that Architect have dew point calculations performed on assembly at Project location using local code requirements and current ASHRAE 90.1 Standards.

Section 072500 "Weather Barriers" for water-resistive barriers.

Section 072715 "Nonbituminous Self-Adhering Sheet Air Barriers" for vapor-retarding and vapor-permeable nonbituminous sheet type air barriers.

Section 072726 "Fluid-Applied Membrane Air Barriers" for vapor-retarding and vapor-permeable fluid-applied air barriers.

* + - 1. DEFINITIONS

Retain definitions remaining after this Section has been edited.

* + - * 1. Composite Wall Panel System Assembly: Composite wall panels, attachment system components, integral flashings, miscellaneous metal framing, and accessories necessary for a complete façade cladding system.
				2. Drained and Back-Ventilated Rainscreen System: Cladding system designed to drain and dry cavity entering water through drainage channels, weeps, and air ventilation.
			1. COORDINATION
				1. Coordinate composite wall panel system installation with rain drainage work, flashings, trim, and construction of studs, soffits, and other adjoining work to ensure proper sequencing and to provide a secure and noncorrosive installation.
			2. PREINSTALLATION MEETINGS

Retain paragraph below if Work of this Section is extensive or complex enough to justify a preinstallation conference.

* + - * 1. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.
			1. ACTION SUBMITTALS

Action submittals are submittals requiring responsive action and return of reviewed documents to Contractor.

* + - * 1. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of composite wall panel and accessory.
				2. Shop Drawings: Show fabrication and installation layouts of composite wall panel systems; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.

Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):

Revise list below to suit Project.

Flashing and trim.

Anchorage systems.

[**Girts**] [**Stud framing**].

Wall-mounted items including doors, windows, louvers, and lighting fixtures.

Penetrations of wall by pipes and utilities.

* + - * 1. Samples for Initial Selection: For each type of composite wall panel indicated with integral color finishes.

Include similar Samples of trim and accessories involving color selection.

Delete "Samples for Initial Selection" Paragraph above if colors and other characteristics are preselected and specified or scheduled. Retain paragraph below with or without above.

* + - * 1. Samples for Verification: For each type of composite wall panel indicated, prepared on Samples of size [**minimum 3-1/2 inches (89 mm) square**] <**Insert sample size**>. [**Submit custom color samples in manufacturer's standard size.**]

Include similar Samples of trim and accessories involving color selection.

* + - 1. INFORMATIONAL SUBMITTALS

Informational submittals are submittals that require review by Architect, but they do not require Architect's responsive action and return of reviewed documents to Contractor, provided submittals comply with requirements. If rejected, submittals with responsive action must be returned to Contractor.

Retain first paragraph below if Work of this Section is required to withstand specific design loads and design responsibilities have been delegated to Contractor or if structural data are required as another way to verify compliance with performance requirements. Professional engineer qualifications are specified in Division 01 Section "Quality Requirements."

* + - * 1. Delegated Design Submittal: For composite wall panel system assembly indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements" and as supplemented in "Quality Assurance" Article.

* + - * 1. Qualification Data: For [**Installer**] [**and**] [**delegated design engineer**].
				2. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
				3. Verification that surface curing technology is Electron Beam Curing.

Retain "Environmental Data" Paragraph below if applicable to Project for sustainability. The EPD and certifications are optional.

* + - * 1. Environmental Data:

Declare: LBC Red List Approved

Environmental Product Declaration (EPD) with statement on 50 years of reference service life.

FSC or PEFC Certification.

Health Product Declaration (HPD).

UL Greenguard Certification.

UL Greenguard Gold Certification.

USDA Biobased Certification.

* + - * 1. Sample Warranty.
			1. CLOSEOUT SUBMITTALS
				1. Maintenance Data: For composite wall panels, including related accessories, to include in maintenance manuals.
			2. QUALITY ASSURANCE
				1. Qualifications:

Manufacturer: ISO 9001 and ISO 14001 Certified.

Installer: All products listed in this Section are to be installed by an installing firm that can prove three years in business and exemplary workmanship. Installing firm must have evidence of installing rainscreen wall panel systems and is suitable for the execution of the work.

Retain "Delegated Design Engineer" Paragraph below if design services have been delegated to Contractor.

Delegated Design Engineer: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated.

Retain paragraph below only if products specified in Part 2 are part of a fire-resistance-rated assembly. Indicate rating, testing agency, and testing agency's design designation on Drawings.

* + - * 1. Fire-Resistance Ratings: Where indicated, provide composite wall panels identical to those of assemblies tested for fire resistance in accordance with ASTM E119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
			1. Mockups
				1. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

Build mockups in size [**48 inches (1219 mm) long by 48 inches (1219 mm) wide**] [**as indicated on Drawings**] <**Insert dimensions**> including[ **corner,**] trim, supports, attachments, and accessories.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Retain subparagraph below if the intention is to make an exception to the default requirement in Section 014000 "Quality Requirements" for demolishing and removing mockups.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver materials to Project site in manufacturer's original, unopened, undamaged containers with identification labels intact.
				2. Comply with manufacturer's written instructions for storage and handling to prevent breakage, bending, warping, twisting, and surface, edge, or corner damage.
				3. Protect components from weather damage.
			2. FIELD CONDITIONS
				1. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of composite wall panels to be performed in accordance with manufacturer's written instructions and warranty requirements.
				2. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements and indicate measurements on Shop Drawings.
			3. WARRANTY

When warranties are required, verify with Owner's counsel that special warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

* + - * 1. Warranty: Provide manufacturer's limited 10-year warranty covering defects in materials from date of shipment to fabricator.

Warranty coverage is based upon manufacturer's material property data sheet to include, but is not limited to, the following:

ASTM D5420 Impact Resistance.

EN 438-2:29 Florida cycle Exposure - 3000 hours with a grey scale of 4-5.

Grey Scale Rating 5: No visible change.

Grey Scale Rating 4: Change of gloss only.

Deterioration of materials beyond normal weathering.

Verify available warranties and warranty periods for units and components with manufacturers listed in Part 2 articles.

Warranty Period: [**10**] <**Insert number**> years from date of Delivery.

1. PRODUCTS
	* + 1. SOURCE LIMITATIONS

Retain this article to limit sources for the entire Section. Source limitations may also be specified in individual articles if desired.

* + - * 1. Provide components and materials specified in this Section from single manufacturer for a complete and compatible assembly.
			1. PERFORMANCE REQUIREMENTS

Coordinate this article with other Part 2 articles. Insert other performance and design criteria below to suit Project or add criteria to Drawings. AIA Document A201 requires Owner or Architect to specify performance and design criteria to be satisfied. Meteon panels meet requirements of NFPA 285 or CAN/ULC S134 (Canada Only) as a component of a tested and allowable assembly. Contact a Trespa representative for a list of allowable NFPA 285 & CAN/ULC S134 assemblies.

* + - * 1. General Performance: Composite wall panel system assemblies will comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

Retain first paragraph below if Contractor is required to assume responsibility for design.

* + - * 1. Delegated Design: Design composite wall panel system assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

ASTM E330/E330M in first paragraph below is for composite wall panels that span structural supports.

* + - * 1. Structural Performance: Provide composite wall panel system assemblies capable of withstanding the effects of the following loads and stresses within limits and under conditions indicated, based on testing in accordance with ASTM E330/E330M:

Requirements under each set of performance criteria below are examples only. Insert design loads to suit Project. Consult a structural engineer experienced in engineering composite wall panel assemblies of type indicated to quantify design loads. Verify compliance with codes.

Design Wind Loads: Determine loads based on the following minimum design wind pressures:

Retain one of first two subparagraphs below. If retaining second, indicate pressures on appropriate elevation Drawings.

Uniform pressure of [**20 lbf/sq. ft. (957 Pa)**] [**15 lbf/sq. ft. (718 Pa)**] <**Insert design wind pressure**>, acting inward or outward.

Uniform pressure as indicated on Drawings.

Deflection Limits: Composite wall panel system assemblies will withstand wind loads with horizontal deflections no greater than [**1/175 of the span**] <**Insert deflection**> or 3/4 inch (19 mm), whichever is less.

Retain "Fire-Resistance Performance" Paragraph below only if products specified are part of a fire-resistance-rated assembly. Indicate rating, testing agency, and testing agency's design designation on Drawings.

* + - * 1. Fire-Resistance Performance: Comply with ASTM E119 for testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency acceptable to AHJ.

Surface-Burning Characteristics: Provide Class A composite wall panels with a flame-spread index of 50 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84. If the project is located in Canada provide a panel with a flame-spread index of 25 or less and a smoke-developed index of 50 when tested in accordance with CAN/ULC S102.2.

Self-Ignition Temperature: Not less than 650 deg F (350 deg C) when tested in accordance with ASTM D1929.

Burning Classification: CC1 or CC2 when tested in accordance with ASTM D635.

Retain "Fire Propagation Characteristics" Paragraph below if required for Project.

* + - * 1. Fire Propagation Characteristics: Composite wall panel assembly passes NFPA 285-2019 or CAN/ULC S134 (Canada Only).
				2. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Differential values in subparagraph below (for aluminum in particular) are suitable for most of the United States.

Temperature Change (Range): [**120 deg F (67 deg C), ambient; 180 deg F (100 deg C)**] <**Insert temperature range**>, material surfaces.

* + - * 1. Exposure Performance:

Humidity Resistance: No formation of blisters when subjected to condensing water fog at 100 percent relative humidity and 100 deg F (38 deg C) for 3000 hours when tested in accordance with ASTM D2247.

Salt Spray Resistance: Corrosion creepage from scribe line not to exceed 0.063 inch (1.6 mm) and minimum blister rating of 8 within the test specimen field when tested in accordance with ASTM B117.

Resistance to Climactic Shock: No visible change when tested in accordance with EN 438-2:19.

Resistance to Artificial Weathering: No visible change when tested in accordance with EN 438-2:29 at a minimum of 3000 hrs.

Resistance to Artificial Weathering: No visible change when tested in accordance with Florida Test cycle (modified EN 438-2:29) at a minimum 3000 hrs.

Color Stability: The decorative surfaces comply with Classification 4 or 5 as measured with the ISO 105 A02 Grey Scale when tested in accordance with EN 438-2:29.

Resistance to Sulfur Dioxide (SO2): No visible change when tested in accordance with DIN 50018.

Thermal Resistance / Conductivity: Result of 0.3 W/mK when tested in accordance with EN 12524.

* + - * 1. Physical Properties:

Resistance to Impact by Large-Diameter Ball: - 6 ≤ t mm at a drop height of 5.9 ft. (1.8 m) with a result of ≤ 0.38 inch (10 mm).

Impact Resistance: A result of 1.0466 ft. in height at 11.3 J in energy when tested in accordance with ASTM D5420.

Dimensional Stability at Elevated Temperatures: Cumulative dimensional change of ≤ 0.25 percent in the longitudinal and transversal direction when tested in accordance with EN 438-2:17.

Resistance to Wet Conditions:

Mass increase of ≤ 3 percent and an appearance rating of ≥ 4 when tested in accordance with EN 438-2:15.

No visible change when tested in accordance with ASTM D2247.

Water absorption result of 0.5 percent when tested in accordance with ASTM D2842.

Modulus of Elasticity:

Result of ≥ 9000 Mpa when tested in accordance with EN ISO 178.

Result of ≥ 1305000 psi when tested in accordance with EN ASTM D638.

Flexural Strength:

Result of ≥ 120 Mpa when tested in accordance with EN ISO 178.

Result of ≥ 17500 psi when tested in accordance with ASTM D790.

Tensile Strength:

Result of ≥ 70 Mpa when tested in accordance with EN ISO 527.

Result of ≥ 10150 psi when tested in accordance with ASTM D638.

Density:

Result of ≥ 1.35 g/cm3 when tested in accordance with EN ISO 1183.

Result of ≥ 1.35 g/cm3 when tested in accordance with ASTM D792.

Resistance to Fixings: Pull out strength of ≥ 3000 N for 0.3150 inch (8 mm) panel) and ≥ 4000 N for ≥ 0.3937 inch (10 mm) panel.

* + - 1. COMPOSITE WALL PANELS <**Insert drawing designation**>

Copy this article and re-edit for each product.

Insert number to complete drawing designation. Use these designations on Drawings to identify each product.

Trespa's Meteon is a decorative high-pressure compact laminate (HPL) with an integral surface manufactured using Trespa's unique in-house technology, Electron Beam Curing (EBC). Meteon is a versatile cladding for innovative and functional ventilated façade systems, soffits, balconies, and sunblind solutions. Meteon panels can be used on their own or in combination with other materials. Meteon must be installed over aluminum sub-structure and is available in either an exposed fastener (TS110) or concealed fastener options (TS210). Trespa's Meteon panels meet performance requirements of NFPA 285-2019 or CAN/ULC S134 (Canada only) as a component of a tested and allowable assembly. Contact a Trespa representative for a list of allowable NFPA 285 & CAN/ULC S134 assemblies.

* + - * 1. Description: Exterior solid phenolic, high-pressure laminate with integrated electronic-beam cured cladding panels fabricated from mixture of proprietary materials as standard with manufacturer, as required to meet structural performance required in drained and back-ventilated rainscreen façade cladding system. Include attachment system components and accessories required for complete assembly.

Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to require a specific product or a comparable product from manufacturers listed.

Basis-of-Design Product: Subject to compliance with requirements, provide Trespa North America, Ltd.; Meteon Exterior Façade Panels or a comparable product by one of the following:

<**Insert manufacturer****'s name**>.

Surface Texture: Smooth, flat finish.

Trespa's Meteon Panels are available in all thicknesses listed below. Select appropriate thickness to meet performance requirements.

Panel Thickness: [**5/16 inch (8 mm)**] [**3/8 inch (10 mm)**] [**1/2 inch (13 mm)**] [**As indicated on Drawings**].

Trespa's Meteon Panels are available in a variety of panel sizes listed below.

Nominal Panel Size: [**14 by 7 ft.**] [**12 by 6 ft.**] [**10 by 5 ft.**] [**8 by 6 ft.**].

Color: [**As indicated by manufacturer's designations**] [**Match Architect's samples**] [**As selected by Architect from manufacturer's full range**] <**Insert color**>.

When colors are selected, insert color in subparagraphs below to suit Project.

Color 1: <**Insert color**>.

Color 2: <**Insert color**>.

Color 3: <**Insert color**>.

Color 4: <**Insert color**>.

* + - * 1. Panel Mounting System: Manufacturer's proprietary panel fastening system suitable for [**drained and back-ventilated**] rainscreen system.

Retain "Basis-of-Design Construction System" Subparagraph and list of manufacturers below to require a specific product or a comparable product from manufacturers listed.

Trespa's "TS110" system is for exposed fastening of composite wall panels. "TS210" system is for concealed fastening of composite wall panels (min. 10 mm). Include "-285" suffix to either system if assembly is specified to meet "Fire Propagation Characteristics" performance requirements of NFPA 285-2019 or CAN/ULC S134 (Canada only). Contact a Trespa representative for a list of allowable NFPA 285 & CAN/ULC S134 assemblies.

Basis-of-Design Construction System: Subject to compliance with requirements, provide Trespa North America; [**TS110**] [**TS110-285**] **[TS110-134]** [**TS210**] [**TS210-285**] [**TS210-134**] mounting system or a comparable product by one of the following:

<**Insert manufacturer's name**>.

* + - 1. MISCELLANEOUS MATERIALS
				1. Miscellaneous Subframing, General: ASTM B317, 6063-T5 or -T6 aluminum. Provide manufacturer's standard sections as required for support and alignment of composite wall panel system assembly.

Include manufacturer's standard [**perimeter extrusions with integral weather stripping**] [**panel stiffeners**] [**panel clips**] [**and**] [**anchor channels**].

Fasteners for Miscellaneous Metal Framing and Subframing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten miscellaneous metal framing members to substrates.

* + - * 1. Finishing Accessories and Trim: Provide [**manufacturer's standard**] [**fabricated**] trim, angles, and similar components at corners, transitions, and rough openings meeting the performance requirements. Finish to match composite wall panels.
				2. Fasteners: Type [**304**] [**316**] stainless steel self-tapping screws, minimum #12 x 1-inch in length, complying with ASTM C1002 as recommended in writing by composite wall panel system manufacturer suitable for and compatible with system materials.
				3. Flashing and Trim: Provide aluminum flashing and trim as required to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, composite wall panel supports, and other conditions affecting performance of the Work.

Retain one or both of first two subparagraphs below.

Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by composite wall panel system manufacturer.

Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by composite wall panel system manufacturer.

Retain first subparagraph below for rainscreen or other cavity systems that depend on weather-resistant sheathing paper to prevent air infiltration or water penetration.

Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

Verify that air cavity space is continuous with unobstructed dimension at a minimum 3/4 inch (19 mm) and maximum dependent on appropriate Trespa wall composite system for full height of composite wall panel system.

* + - * 1. Examine roughing-in for components and systems penetrating composite wall panels to verify actual locations of penetrations relative to seam locations of panels before panel installation.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION
				1. Clean substrate surfaces thoroughly prior to installation. Prepare substrate surfaces using methods recommended in writing by composite wall panel system manufacturer.
				2. Prepare subframing and provide anchorage for substrate type and exterior cladding type in accordance with composite wall panel system manufacturer's written instructions.
				3. Miscellaneous Framing: Install subgirts, base angles, sills, furring, and other miscellaneous wall panel support members and anchorage in accordance with ASTM C754 and composite wall panel system manufacturer's written instructions.
			2. COMPOSITE WALL PANEL INSTALLATION
				1. General: Install composite wall panels in accordance with manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts unless otherwise indicated. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.

Shim or otherwise plumb substrates receiving composite wall panels.

Flash composite wall panels at perimeter of all openings. Do not begin installation until air- or water-resistive barrier and flashings that will be concealed by panels are installed.

Install flashing and trim as composite wall panel work proceeds.

Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, for waterproofing.

Align bottoms of composite wall panels.

* + - * 1. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action in accordance with composite wall panel system manufacturer's written instructions.
				2. Attachment System Installation, General: Install attachment system required to support composite wall panel system, including subgirts, panel clips, and anchor channels.

Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

* + - * 1. Clip Installation: Attach panel clips to supports at each composite wall panel joint at locations, spacings, and with fasteners in accordance with composite wall panel system manufacturer's written instructions. Attach flanges of wall panels to panel clips with manufacturer's standard fasteners.
			1. ACCESSORY INSTALLATION

Revise first paragraph below to suit Project. Delete items not required.

* + - * 1. General: Install accessories with positive anchorage to building and provide for thermal expansion. Coordinate installation with flashings and other components.

Install components required for a complete composite wall panel assembly including trim, copings, corners, seam covers, flashings, gaskets, fillers, closure strips, and similar items.

* + - * 1. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated.

Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates.

Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 ft. (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection.

* + - 1. ERECTION TOLERANCES
				1. Installation Tolerances: Shim and align composite wall panel system within installed tolerance of 1/4 inch in 20 ft. (6 mm in 6 m), nonaccumulative, on level, plumb, and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
			2. CLEANING AND PROTECTION
				1. Remove temporary protective coverings and strippable films, if any, as composite wall panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of composite wall panel installation, clean finished surfaces as instructed by panel manufacturer. Maintain in a clean condition during construction.
				2. After composite wall panel installation, clear weep holes and drainage channels of obstructions.
				3. Replace composite wall panels that have been damaged.

END OF SECTION 074243