SECTION 06 6400 - PLASTIC PANELING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:

1. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas, available on the web site of the Texas Facilities Commission.
2. The University of Houston's *Supplemental General Conditions and Special Conditions for Construction*.

1.2 SUMMARY

A. Section includes glass-fiber reinforced plastic (FRP) wall paneling and trim accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

Retain paragraph and associated subparagraphs below if Project is to be LEED v4 certified.

B. LEED Action Submittals (Projects authorized for LEED certification only):

1. Building Product Disclosure and Optimization:

a. Leadership Extraction Practices

1) Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.

2) Wood Products: Certified by Forest Stewardship Council or USGBC approved equivalent.

a) Chain-of-Custody Certificates: For certified wood products. Include statement of costs.
b) Chain-of-Custody Qualification Data: For manufacturer and vendor.

3) Provide details of biobased material per Sustainable Agriculture Network's Sustainable Agriculture Standard or USDA certified biobased product. Indicate cost, location of extraction, manufacture, and purchase of material.
4) Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.

a) Include statement indicating costs for each product having recycled content.

b. Sourcing of Raw Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.

1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.
2) Product Certificates: For materials manufactured within 100 miles of Project, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each raw material.

2. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010, using the applicable exposure scenario.

a. Paints, and Coatings: For wet applied on site products, include printed statement of VOC content, showing compliance with the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3,-2011.
b. Adhesives and Sealants: For wet applied on site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005 and rule amendment date of January 7, 2005.

1) Product Data: For installation adhesives, indicating VOC content.

c. Alternative tests for VOC above include ASTM D2369-10; ISO 11890 part 1; ASTM D6886-03; or ISO 11890-2.

d. Methylene Chloride and perchloroethylene may not be added to paints, coating, adhesive or sealants.
e. Composite Wood: Submit documentation showing that wood used in the project has low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low emitting formaldehyde (ULEF) resins or no added formaldehyde resins.
f. Provide General Emissions Evaluation certificates for adhesives, sealants showing compliance with California Department of Public Health v1.1 emissions testing or equivalent.

3. Laboratory Test Reports: For installation adhesives indicating compliance with requirements for low-emitting materials.

C. Samples for Verification: For plastic paneling and trim accessories, in manufacturer's standard sizes.

1.4 INFORMATIONAL SUBMITTALS

A. Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

B. Certified test reports showing compliance with specified performance characteristics and physical properties.

Retain paragraph and associated subparagraphs below if Project is to be LEED v4 certified.

C. LEED Informational Submittals:

1. Building Product Disclosure and Optimization - Sourcing of Raw Materials:

a. Raw Material Sources and Extraction Reporting: Submit Raw materials supplier corporate Sustainability Reports (CSRs); documenting responsible extraction; including extraction locations, long term ecologically responsible land use, commitment to reducing environmental harms from extraction and manufacturing processes, and a commitment to meeting applicable standards or programs that address responsible sourcing criteria

1) Submit manufacturers' self-declared reports
2) Submit third party verified corporate sustainability reports (CSR) using one of the following frameworks"

a) Global Reporting Initiative (GRI) Sustainability Report
b) Organization for Economic Co-operation and Development (OECD)
c) Guidelines for Multinational Enterprises
d) UN Global Compact
e) ISO 26000
f) USGBC approved program.

2. Building Product Disclosure and Optimization - Material Ingredients

a. Material Ingredient Optimization: Submit manufacturer's Environmental Product Declaration (EPD) or at least one of the following:

1) GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
2) Cradle to Cradle: Manufacturer's published literature for the product bearing the Cradle to Cradle logo.
3) International Alternative Compliance Path - REACH Optimization
4) Declare: Manufacturer's completed Product Declaration Form
5) Other programs approved by USGBC

b. Product Manufacturer Supply Chain Optimization: Submit documentation from manufacturers for products that go beyond material ingredient optimization as follows:

1) Are sourced from product manufacturers who engage in validated and robust safety, health, hazard, and risk programs which at a minimum document at least 99 percent (by weight) of the ingredients used to make the building product or building material, and
2) Are sourced from product manufacturers with independent third party verification of their supply chain that at a minimum verifies:

a) Processes are in place to communicate and transparently prioritize chemical ingredients along the supply chain according to available hazard, exposure and use information to identify those that require more detailed evaluation
b) Processes are in place to identify, document, and communicate information on health, safety and environmental characteristics of chemical ingredients
c) Processes are in place to implement measures to manage the health, safety and environmental hazard and risk of chemical ingredients
d) Processes are in place to optimize health, safety and environmental impacts when designing and improving chemical ingredients
e) Processes are in place to communicate, receive and evaluate chemical ingredient safety and stewardship information along the supply chain
f) Safety and stewardship information about the chemical ingredients is publicly available from all points along the supply chain.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain plastic paneling and trim accessories from single manufacturer.

Products with flame-spread index of 25 or less are readily available and are usually designated Class A. Most other products have flame-spread index of 200 or less and are designated Class C.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 200 or less.
2. Smoke-Developed Index: 450 or less.

Retain second option in subparagraph below if FMG approval is required for insurance purposes.

3. Testing Agency: [**Acceptable to authorities having jurisdiction**] [**FM Approvals**] [**UL**].

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1. Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

B. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to replace plastic paneling that exhibits material failure within the specified warranty period. Failures include, but are not limited to, the following:

1. Delaminating.
2. Warping.

B. Warranty Period: [**Two years**]<**Specify term**.> commencing on Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PLASTIC SHEET PANELING

A. General: Gelcoat-finished, glass-fiber reinforced plastic panels complying with ASTM D 5319.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Standard FRP (P 100 White) by Marlite www.marlite.com or comparable product by one of the following:
   a. Fibertech; Product: www.fibertech.net
   b. Fiberglass Specialties, Inc.; Product: www.fiberglassspecialties.com

c. Kwalu LLC; Product: [Rigid Wall Covering]: www.kwalu.com
d. Substitutions: See Division 01 Section “Product Requirements.”

Retain "Low-Emitting Materials" Subparagraph below if required for LEED for Schools.

2. Low-Emitting Materials: Paneling shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

Verify availability with manufacturers selected before retaining a thickness in first subparagraph below. 3/32 inch is slightly greater than 0.09 inch (2.3 mm).

3. Nominal Thickness: Not less than 2.3 mm].
4. Surface Finish: Match Architect's sample.
5. Color: Match Architect's sample.

2.2 FACTORY-LAMINATED PLASTIC PANELS

A. General: Gelcoat-finished, glass-fiber reinforced plastic panels complying with ASTM D 5319, laminated to [plywood] [oriented strand board] [fire-retardant particleboard] [gypsum board] [high-impact gypsum board] [moisture- and mold-resistant gypsum board].

1. Basis-of-Design Product: Subject to compliance with requirements, provide [**product indicated on Drawings**] <**Insert manufacturer's name; product name or designation**> or comparable product by one of the following:

a. Marlite; Product <**Insert product name here**>: www.marlite.com
b. Fibertech; Product <**Insert Note Here**>: www.fibertech.net
c. Fiberglass Specialties, Inc.; Product <**Insert Note Here**>: www.fiberglassspecialties.com
d. Kwalu; Product <**Insert Note Here**>: www.kwalu.com
e. Substitutions: See Division 01 Section “Substitution Procedures.”

Retain "Low-Emitting Materials" Subparagraph below if required for LEED certification.

2. Low-Emitting Materials: Paneling shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

Verify availability with manufacturers selected before retaining a thickness in first subparagraph below. 3/32 inch is slightly greater than 0.09 inch (2.3 mm).

3. Glass-Fiber Reinforced Plastic Panel Nominal Thickness: Not less than [**0.76 mm**] [**1.3 mm**] [**1.9 mm**] [**2.3 mm**].

4. Surface Finish: [**Smooth**] [**Molded pebble texture**] [**Smooth surface with filled grooves at 102 mm o.c. to resemble tile**] [**As indicated by manufacturer's designations**] [**Match Architect's sample**] [**As selected by Architect from manufacturer's full range**].
5. Color: [**White**] [**As indicated by manufacturer's designations**] [**Match Architect's sample**] [**As selected by Architect from manufacturer's full range**].
6. Plywood: DOC PS 1, Exterior B-C, [**6.4 mm**] [**9.5 mm**] [**12.7 mm**] [**15.9 mm**] [**19.1 mm**] thick.
7. Oriented Strand Board: DOC PS 2, [**6.4 mm**] [**9.5 mm**] [**12.7 mm**] [**19.1 mm**] thick.
8. Fire-Retardant Particleboard: Product complying with ANSI A208.1, Grade M-S, except for modulus of rupture; with flame-spread index of 25 or less per ASTM E 84; and [**9.5 mm**] [**12.7 mm**] [**19.0 mm**]thick and containing no added urea formaldehyde.

Specify product with no added urea formaldehyde such as the one below.

   a. Product: Georgia-Pacific Panel Products Temstock Free/FR or approve equivalent.

9. Gypsum Board: ASTM C 1396/C 1396M, [**Regular, 12.7 mm**] [**Type X, 15.9 mm**].

Specify product with no added urea formaldehyde such as the one below.First subparagraph below specifies National Gypsum's "High-Impact Brand Wallboard" gypsum board.

10. High-Impact Gypsum Board: ASTM C 1396/C 1396M, 15.9 mm, with Type X core, and [**0.254-mm**] [**0.508-mm**] [**0.762-mm**] [**2.057-mm**] plastic film laminated to back side for greater resistance to through penetration (impact resistance).

Examples of moisture- and mold-resistant panels include USG's "SHEETROCK Brand HUMITEK" panels and National Gypsum's "XP Wallboard," which are both paper faced; and Georgia-Pacific's "DensArmor Interior Guard" panels, which have coated glass-mat facings.

11. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M or ASTM C 1178/C 1178M, 15.9 mm, Type X, with moisture- and mold-resistant core and surfaces.

12. Laminating Adhesive: Manufacturer's standard adhesive that is recommended by AWI/AWMAC to suit application.

2.3 ACCESSORIES

Retain one of first two paragraphs below if using trim. Delete "outside corners" option in either paragraph if using corner guards specified in Section 10 2600 "Wall and Door Protection" instead of using outside corner trim. Product in first paragraph is available only for plastic sheet paneling and factory-laminated panels with 3/8-inch- (9.5-mm-) thick backing.

A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners,[**outside corners**,**]** and caps as needed to conceal edges.

1. Color: Match panels.

B. Trim Accessories: Manufacturer's standard two-piece, snap-on vinyl extrusions designed to cover edges of panels. Provide division bars, inside corners,[**outside corners,**] and caps as needed to conceal edges.

1. Color: Match panels.

C. Exposed Fasteners: Nylon drive rivets recommended by panel manufacturer.

D. Concealed Mounting Splines: Continuous, H-shaped aluminum extrusions designed to fit into grooves routed in edges of factory-laminated panels and to be fastened to substrate.

E. Adhesive: As recommended by plastic paneling manufacturer.

Retain first subparagraph below if required for LEED certification. VOC content limit is that for gypsum board and panel adhesive.

1. Adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

Retain subparagraph below if required for LEED for Schools.

2. Adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

Manufacturers recommend the use of sealant with trim accessories in high-moisture or wet areas. Sealant can also be used with factory-laminated panels without trim in areas where moisture and wetting are not a concern.

F. Sealant: Single-component, mildew-resistant, neutral-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Division 07 Section "Joint Sealants."

Retain first subparagraph below if required for LEED certification.

1. Sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

Retain subparagraph below if required for LEED certification.

2. Sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

Retain any or all of first three paragraphs below for adhesive application; first two are primarily for renovation work.

A. Remove wallpaper, vinyl wall covering, loose or soluble paint, and other materials that might interfere with adhesive bond.

B. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.

C. Clean substrates of substances that could impair bond of adhesive, including oil, grease, dirt, and dust.

Manufacturers' recommendations for conditioning vary. Marlite recommends 48 hours; other manufacturers may recommend 24 hours.

D. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.

E. Lay out paneling before installing. Locate panel joints [where indicated] [to provide equal panels at ends of walls not less than half the width of full panels] [so that trimmed panels at corners are not less than **300 mm** wide].

1. Mark plumb lines on substrate at [**trim accessory**] [**panel joint**] locations for accurate installation.
2. Locate [**trim accessories**] [**panel joints**] to allow clearance at panel edges according to manufacturer's written instructions.

3.3 INSTALLATION

A. Install plastic paneling according to manufacturer's written instructions.

Retain one of first two paragraphs below to suit installation method required for substrate.

B. Install panels in a full spread of adhesive.

C. Install panels with fasteners. Layout fastener locations and mark on face of panels so that fasteners are accurately aligned.

1. Drill oversized fastener holes in panels and center fasteners in holes.
2. Apply sealant to fastener holes before installing fasteners.

Retain first paragraph below in addition to one of last two paragraphs above if required for factory-laminated panels.

D. Install factory-laminated panels using concealed mounting splines in panel joints.

E. Install trim accessories with [**adhesive**] [**and**] [**nails**] [**or**] [**staples**].[**Do not fasten through panels**.]

Retain first paragraph below if using sealant with trim accessories. Manufacturers recommend the use of sealant in high-moisture or wet areas.

F. Fill grooves in trim accessories with sealant before installing panels and bed inside corner trim in a bead of sealant.

Usually retain first paragraph below whether trim accessories are used or not. Delete if not applicable.

G. Maintain uniform space between panels and wall fixtures. Fill space with sealant.

Retain first paragraph below if installing panels without trim accessories.

H. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.

3.4 CLEANING AND PROTECTION

A. Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products that have been damaged.

B. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

1. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

C. Remove construction debris from project site and legally dispose of debris.

END OF SECTION 06 6400