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**ARCHITECTURAL FIBERGLASS REINFORCED POLYESTER SPECIFICATIONS**

**SECTION 06610 – ARCHITECTURAL FIBERGLASS CORNICE**

## PART 1 – GENERAL

### 1.01 SUMMARY

A. Section Includes:
   1. Fabrication of fiberglass – reinforced polyester cornice profiles.

B. Related Documents and Sections:
   1. General Conditions, Supplementary Conditions and Division 1 General Requirements apply to the work of this section.
   2. Section 05120 “Structural Steel Support Framing”
   3. Section 06100, “Rough Carpentry”, for blocking.
   4. Section 07901, “Joint Sealants”.

### 1.02 QUALITY ASSURANCE

A. The fiberglass manufacturer shall be one who is currently in the business of manufacturing and supplying architectural fiberglass components for the building construction industry and who can demonstrate the capability.

B. The fiberglass manufacturer shall have been engaged in the fiberglass industry for at least 10 years doing work with projects comparable in size, scope, detail, and complexity to that shown and specified.

C. Submit a list of comparable projects, locations, and owner contacts with bid documents.

D. Submit manufacturer’s current valid certification with The Certified Composites Technician (CCT) program created by the American Composites Manufacturer’s Association (ACMA).

E. Submit manufacturer’s internal Quality Control & Assurance Procedures based on provisions published in the “Guidelines and Recommended Practices for Fiberglass Reinforced Plastic Architectural Products”.

F. Single Source Responsibility for Architectural Fiberglass: Obtain architectural fiberglass from a single source with resources to provide products complying with requirements indicated without delaying the work.

G. Fire Test Response Characteristics: Provide architectural fiberglass and related materials with fire test response characteristics as specified elsewhere in this section as determined by testing identical products per test method ASTM E-84 or other testing and inspecting agency acceptable to authorities having jurisdiction. Provide written certification that supplied architectural fiberglass panels meets or exceeds the criteria.

H. Manufacturer's Vendor Approved Manufacturing Program (VAMP). Vendor shall have certified documentation regarding manufacturing processes and materials from a recognized vendor in the composites industry.

**1.03 SUBMITTALS**

A. Qualification Data

For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

B. Product Data:

For products of standard manufacture, not custom fabricated for this work, submit manufacturer's catalog illustrations, specifications, anchor details and installation instructions.

C. Color Selection:

Submit custom color sample selection chips of actual material showing color, texture and sheen available for initial review.

Architect may supply custom paint color sample for matching.

D. Shop Drawings:

Submit CAD shop drawings for fabrication and erection. Include plans, elevations, sections, profiles, and details of cornice panels. Indicate dimensions of each profile and component. Include for comparison a dimensioned drawing showing plan elevation section and details of existing cornice section used for model purposes if applicable. Indicate those features, which differ from fiberglass replication. Include details for panel connections, anchorage to substructure and all miscellaneous accessories. Show all special corner pieces, splices for panels and inside corner transitions and terminations for panels. Provide layout drawings including seam locations for each elevation.

E. Samples:

For each cornice type submit sample cornice panel section, large enough to include all panel features including joints. Construct sample panel to show all connection points, embedded connection and reinforcing clips, include typical fasteners to complete the submission.

F. Submit detailed maintenance instructions for inclusion in final operation and maintenance manuals.

G. Submit warranty on completed fiberglass components in writing against defects of materials and workmanship and to meet the specified requirements of this Section for a period of one (1) year from delivery to site.

H. Submit documentation showing bond ability, client references, trade references, evidence of insurance coverage, LEED information, product testing results, VAMP documentation, CCT Certification.

### 1.04 VERIFICATIONS OF CONDITIONS

A. Prior to proceeding with any work, Contractor to carefully check and verify all pertinent dimensions on the project drawings and the Contractor shall verify on site dimension and assume full responsibility for fitting the components to the structure.

B. The components indicated on the drawings show dimensions established to accomplish the Architect's intended visual result and to conform to the building's configuration. The Contractor shall verify that the components to be actually provided for the work of this Section will fit the building's structural elements and conform to the visual design criteria indicated on the drawings without materially altering profiles and alignments.

C. Any additional support or backing for the components shall be provided and installed by the Installation Contractor as part of the work of this section.

D. Prior to commencement of work review the job site before selective demolition begins to determine the layout, spacing and termination of the existing cornice. Duplicate these layouts intersections and relationships in so far as practical. Identify and resolve panel detail conflicts in advance and identify such condition and resolutions on the shop drawings.

E. Carefully measure each existing cornice assembly component and replicate size, profile, position, and detail in the finished panel so far as practical. Indicate on shop drawings those indentations and/or detail which cannot be duplicated in the replication due to physical limitations of the manufacturing process.

### 1.05 PERFORMANCE CRITERIA

A. Structural Properties

The fiberglass reinforced polyester components shall be engineered, fabricated and erected to conform to the specifications and applicable requirements as specified by local codes to fit the building structure and to conform to the Architect's design criteria. Provide Professional Engineer's stamped drawings and calculations if design warrants.

### 1.06 WARRANTY

In addition to the guarantee referenced in the Agreement between the Owner and the Contractor (the Contract), the work of this Section shall be guaranteed in writing against defects of materials and workmanship and to meet the specified requirements of this Section for a period of one (1) year from delivery to site. Additionally, all manufacturers guarantee for materials will be passed on to customer.

## PART 2 – PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURES

Subject to compliance with requirements, fiberglass manufacturer offering products that may be incorporated in work include:

## 2.02 PATTERNS, MOCK-UPS AND MOLDS

A. Upon approval by the Architect of the shop drawings, inspection of the patterns, mock-ups, and/or molds shall be approved by the Architect on-site or at the facilities of the fiberglass manufacturer.

B. Patterns and mock-ups shall be hand carved and machined by skilled craftsmen who have a minimum of ten (10) years experience in fabrication of Architectural Exterior and Interior Trim and Facade components and/or related design projects.

C. Molds shall be constructed of from 10-12 layers of glass fibers with tooling gel-coat and/or rubber molds and shall be fabricated by skilled craftsmen with a minimum of ten to twelve (1 0-1 2) years experience in fabricating of architectural components for similar projects.

D. Production molds shall be constructed from successive layers of glass fiber with tooling gel coat or alternately from rubber molds. Molds shall be constructed with sufficient thickness and rigidity to prevent deflection, warpage and defects during panel production.

## 2.03 FIBERGLASS AND RESIN MATERIALS

A. General: The fiberglass reinforced polyester plastic components shall be designed, fabricated and erected to conform to the state of Building Code, Local Codes and to the Architect's design criteria.

B. Glass cloth, matt and "chop" shall be equal to the products of PPG-Owens Corning.

C. Polyester resigns shall be equal to Class A, Edon Spec 67. The resin shall be flame retardant, promoted thixotropic polyester resin designed for use in hand laid up and spraying processes. The resin shall be specifically formulated for use in applications that require an ASTM E 84, Class I flame spread rating, without the use of fillers or antimony trioxide, with an ASTM E 84 flame spread rating of *25* unfilled smoke density of *450* or under.

D. Gel Coat: The gel coat shall be a high-performance product with ultraviolet inhibitors as recommended by the gel coat and fiberglass panel manufacturer.

Acceptable products are:

1. LHM2900 Low Hap HydroShield Lite NPG ISO Marine Gelcoat by HK Research, 908 Lenoir Road, Hickory, NC 28603, (800) 334-5975

2. "951-Armorcote IMC" by Cook Composites and Polymers Co., P. O. Box 419389, Kansas City, MO 64141-6389, (816) 391-6000.

3. "Max-Guard" Series by Ashland Inc., 2 Joy Drive, Budd Lake, NJ 07828, (908) 850-3046

4. "Ultra Shield-NPG" by Ferro Corporation, 6060 Parkland Blvd., Mayfield Heights, OH 44124 (216) 875-5600

E. Gel coat thickness shall be 0.015" minimum to 0.025" maximum.

### 2.04 PANEL FABRICATION

A. Fiberglass-reinforced polyester cornice sections shall be manufactured using the specified resins, reinforced with chopped glass fibers. All exposed surfaces shall be finished with custom colored gel-coat

B. Internal metal reinforcement, anchorage clips, brackets and all other “built-in” accessories shall be captured and additionally reinforced with additional glass fiber and mat of sufficient thickness as required by the panel manufacturers design.

C. Final ratio of materials shall be 25% fiber, 75% resin for body of components.

D. Any foam reinforcing equal to Divinycel H-60

E. All metal hardware, both loose and embedded, shall be stainless steel or aluminum as designed by manufacturer. All fasteners to be stainless steel.

F. Component thickness shall be 1/8- 3/16” minimum. For any sandwich core construction 7/16” minimum.

G. Gel-coated thickness shall be .015” to .025”.

H. Finished components shall be true to line in the shapes indicated on the drawings, free of warps, twists, waves or distortion.

I. Joints in components shall be matched at the factory and numbered for field installation. Components shall be fabricated to minimize exposed fasteners.

J. Full-size models and mock-ups shall be hand carved and machined as required to produce the replication patterns.

K. Form panel ends with sealable lap joints. Use lap joints with sufficient depth to accommodate mating and alignment of panel surfaces and panel-to-panel sealant components.

L. Provide all special transition, corner pieces (inside and outside) and special closures necessary for a complete, visually continuous, weather tight installation.

1. All inside and outside corners shall be shop fabricated. Fabrication of corners in field <u>will not</u> be permitted.

M. Coordinate cutouts required for drain inlets, rainwater conductors and other penetrations. Reinforce panel as required and provide special formed closures to make joints and intersection weather tight.

## PART 3 – EXECUTION

### 3.01 HANDLING AND SHIPMENT

A. Provide shipping crates of sufficient size and strength to protect components during shipping or ship fiberglass components in padded dedicated moving van.

B. Provide additional protection as may be necessary to prevent soiling of surfaces and marring of finish.

**3.02 INSTALLATION**

A. Select installer who can demonstrate their experience in working with FRP. Provide installer with FRP manufacturer's final approved shop drawings, installation video / DVD, and written installation instructions

B. FRP component assembly hardware to be provided by FRP manufacturer, Internal metal reinforcement anchorage clips, brackets, fasteners and stainless steel hardware to be supplied by contractor or installer.

C. Coordinate required blocking for attachment of cornice panels to substructure. Provide additional, wood preservative treated or metal stud framing as may be required to attached and reinforce cornice panels for a solid installation.

1. Coordinate installation with any metal gutter lining work or flashing above and wood/metal substrates.

D. Erect cornice panels plumb, square and true to line and level. Follow fiberglass panel manufacturer's recommendations with regard to installation clearances, notches, and formation of panel-to-panel joints.

E. Position supports and anchorage devices and set fiberglass components in place prior to securing fasteners.

F. Install sealant and accessories as work progresses, so as to make the work weather tight.

G. Provide each panel with joints such that adjacent panels mate to produce flush joints. Recess blocking or notch continuously behind each panel joint. Set panels to ensure a maximum joint thickness of 3/8".

H. Prepare each cornice panel section for installation by carefully sanding joints and shrinkages where blocking occurs to assure a tight flush fit.

I. Fill joints with a continuous bead of sealant, tooling finished joints to a slightly concave profile ensuring complete filling and flush installation.

J. Carefully monitor ambient temperatures at time of panel installation and observe all panel-to-panel clearances recommended by the fiberglass manufacturer.

K. Do not cut or abrade finishes, which cannot be completely restored in the field. Installer to make small inconspicuous finish repairs using manufacturer's color matching gel fill finish. If too large of a repair is needed, return to fiberglass manufacturer for alterations or new units.

L. Use only stainless steel connectors approved by the panel manufacturer and which will develop the strength required by fiberglass panel manufacturer's calculations. The installer shall supply these connectors.

M. Countersink all exposed fasteners. Patch all attachment holes with gel fill finish supplied by the fiberglass panel manufacturer for field application. Finish attachment points so that there is no detectable difference in the completed panel surface.

N. Clean installed panel to remove all dirt, smudges, and construction dirt. Use only those cleaning products and procedures recommended by the fiberglass manufacturer.

O. For components requiring field painting after installation, use quality primer and paint as recommended by paint manufacturer

**FIBERGLASS REINFORCED POLYESTER (F. R. P.)**

FLAME RETARDANT RESINS, Class 1. Offers a wide variety of flame retardant properties.

Engineered specifically for building products and a myriad of other interior and outdoor applications. Meets the most exacting requirements of local fire codes, BOCA, DOT and other, government specifications.

**TYPICAL PHYSICAL PROPERTIES**

| Properties | 1/8" Unfilled Casting | 1/8" Glass Laminate |
|---|---|---|
| Flexural Strength, psi 77°F | 16,000 | 30,000 |
| Flexural Modulus, psi x $10^6$, 77°F | 0.48 | 1.3 |
| Tensile Strength, psi 77°F | 8,700 | 18,000 |
| Elongation, % | 2.2 | - |
| Barcol Hardness | 45 | 50-55 |
| Glass Content, % | - | 29.8 |

**FLAMMABILITY PROPERTIES***

(1/8- Glass Mat Laminate)

ASTME-84 (tunnel test) flame spreadless than 25 (unfilled)
smoke density.....less than 450 (unfilled)
H LT- 1 5 Rating.....100
ASTM D-635-74 .....AEB<1.0 CM
.....ATB<5 sec.
ASTM D-2863-74 (Oxygen Index) .....36.5