



DEC Architectural Composites

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**SECTION 068200
GLASS FIBER REINFORCED POLYMER FABRICATIONS
FIBER REINFORCED POLYMER- (FRP)**

PART 1. GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings, Conditions of the Contract and Division 1 Specifications sections, apply to work of this section.

1.02 SUMMARY

- A. Section Includes: Manufactured Fiberglass Forms/Glass Fiber Reinforced Plastic (FRP) fabrication and installation as scheduled and shown on the architectural drawings.

1.03 RELATED WORK IN OTHER SECTIONS

- A. Section 04720 - Cast Stone.
- B. Section 07900 - Joint Sealers: Sealant materials for open joints.
- C. Section 09255 - Gypsum Fabrications.
- D. Section 5400 - Light Gauge Metal Framing

1.04 SUBMITTALS

- A. Samples: Submit four (4) each, 12" x 12" samples demonstrating finish to be supplied (finish per contract).
- B. Shop Drawings: Submit shop drawings delineating all details required for fabrication and installation. Shop drawings to indicate the necessary blocking and attachment to the building or framing as required to support and secure the FRP material only. Framing details and structural support of framing is not the responsibility of the FRP manufacturer, and it is to be engineered by others unless previously agreed to by contractor/subcontractor and DEC, and noted accordingly in the material supply contract.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Firm with manufacturing and delivery capacity required for the project, shall have successfully completed at least ten projects within the past five years, utilizing systems, materials and techniques as herein specified.

- B. Fabricator must own and operate its own manufacturing facilities for all material components. "Stick Built" or "kit of Parts Systems" consisting of components from a variety of manufacturers will not be considered or accepted.
- C. All Fiberglass forms shall match approved samples.
- D. All Fiberglass forms will be installable according to details submitted in shop drawings.

1.06 MANUFACTURER QUALIFICATION:

- A. Firms specified in Approved Manufacturers (section 2.01) must demonstrate their capabilities and experience by including lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.07 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be protected during fabrication, shipment, site storage and erection to prevent damage to the finished work from other trades. Store materials inside a well-ventilated area, away from uncured concrete and masonry, and protected from weather moisture, soiling, abrasion, and extreme temperatures.

1.08 WARRANTY

- A. Warrant fabrications to be free from defects due to materials and workmanship for one year.

PART 2. PRODUCTS

2.01 APPROVED MANUFACTURERS

A. DEC ARCHITECTURAL COMPOSITES

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- B. The listed manufacturer shall not be construed as closing the specifications to other prospective manufacturers, but rather as establishing a level of quality in a composite fabrication system. Other manufacturers may be submitted for approval, as provided for in the specifications at least 14 working days prior to submission of bids. Companies desiring to submit a proposal shall submit all descriptive information of the system proposed including photographs and shop drawings of at least three projects similar in detail and scope.

2.02 MATERIALS

A. Description: Fiber Reinforced Polymer (FRP)

- 1. Pre-molded FRP parts are fabricated to details and dimensions shown and shall conform to the standards set forth in Section 2.03.

2.03 PHYSICAL PROPERTIES OF DEC FRP™ (Fiber Reinforced Acrylic Resin)

<u>Property Value</u>	<u>Test Method/Result</u>
Compression	ASTM-D-695 27,000 psi
Shear Strength	2,336 psi

<u>Property Value</u>	<u>Test Method/Result</u>
CTE Average	ASTM-D-696 23.2 x 10 ⁻⁶ in./in./°F
Density	ASTM-D-792 110 lbs/cu.ft.
Flammability – Class I Materials	ASTM-E-84 25 or less Flame/50 or less Smoke
Flexural Strength	ASTM-D-790 22,000 psi
Flexural Modulus x 10 ⁶	ASTM-D-790 1.38 ksi
Tensile Strength	ASTM-D-638 11,500 psi
Tensile Strength Modulus x 10 ⁶	ASTM-D-638 2.0 ksi
Unit Weight (lbs./sq.ft. at 3/16")	1.5-2 lbs.
Glass Content	14.9%
ATH Content	43%
Resin Content	41.6%

1. All material shall be Class I Fire-Rated with a flame spread of 25 or less when tested in accordance with ASTM/ E84. The use of Antimony Oxide is not permitted. Test documentation is required to be submitted.
2. All parts to contain supports as required to keep within allowable tolerances.
3. Resins: Base Resin is to be a Thixotropic Thermoset Polyester Resin. Formulation will include hydrated fillers to meet the Class I fire-rating.
4. Reinforcement
 - a. The manufacturer may use chopper spray, hand laminated mat and/ or core-mat as reinforcement. The reinforcement used should correlate to the end use performance requirements of the product. At all times, minimum physical properties must be met.
 - b. Large flat surfaces and/ or extended spans must contain additional reinforcement laminate. Jobsite conditions, specific material performance requirements and special conditions may dictate the additional reinforcement.

2.04 FINISH

- A. Surface texture/Exposed side: Smooth or as indicated on drawings.
- B. Gel Coat, if indicated on drawings:
 1. Gel Coat should be a high quality, neopentyl glycol (NPG) isophthalic gel coat with UV stabilizers.
 2. Coat thickness should be 18 to 25 mils.

2.05 TOLERANCES

- A. Part Thickness: $\pm 3/16$ "
 Dimensions all directions: $\pm 3/16$ "
 Variation from Square: $1/8$ inch
- B. Hardware Location Variation: $\pm 1/4$ inch.
- C. Warpage or bowing 1/4" in 8 ft.

2.06 FABRICATION

- A. Molds to be constructed and properly reinforced to produce units conforming to the required profiles, dimensions and tolerances.
- B. Allowable Tolerances:

1. Dimensional Tolerances: $\pm 1/8$ "
2. Shell Thickness: Nominal $3/16$ "
3. Out of Plumb: $\pm 1/8$ "
4. Bowing: L/360 Maximum

2.07 IDENTIFICATION

- A. Identify each part with a permanent part number.
- B. Number parts to coordinate with shop drawings.

PART 3. EXECUTION

3.01 PRE-INSTALLATION EXAMINATION

- A. Installer to observe field conditions and verify that substrates are ready for installation of fabrications.
- B. Proper on-site storage of materials must be performed to ensure all materials are protected from the elements and other trades. FRP parts must be stored or supported to prevent deformation, warping, bowing, physical damage and/or conditions that may make the product unsuitable for intended use.
- C. Installer to check field dimensions affecting the installation of FRP fabrications.
- D. Installer to verify that bearing surfaces are true and level.
- E. Installer to verify that support framing has been constructed to allow accurate placement, alignment and connection of fabrication to structure.
- F. Installer to report discrepancies between design dimensions and field dimensions, which could adversely affect installation, to the contractor and architect.
- G. Do not proceed with installation until discrepancies are corrected, or until installation requirements are modified and approved by the contractor and architect.
- H. Start of installation constitutes acceptance of existing conditions.

3.02 INSTALLATION

- A. General:
Employ only workmen experienced, skilled and trained on this type of quality erection work.
- B. Workmanship
Install work in this section complete, straight, plumb, level, in true alignment and securely anchored. Set forms with all joints properly adjusted for expansion and contraction.
- C. Erection
Fiberglass forms shall be installed per drawings, including the approved shop drawings, and the manufacturer's written recommendations and instructions for this project. Additional framing and blocking may be required, as project conditions require (to be determined by project structural engineer, unless otherwise specified).
- D. Sealing and Caulking
Shall conform to requirements of Caulking and Sealing Section 07900 and requirements indicated and specified herein.

1. Joints and Sealants: Joints (quantity, sizes, and shapes) indicated on contract drawings are minimum requirements.

E. Replacements

1. Fiberglass forms may be rejected for the following reasons:
 - a. Non-conformance to detail requirements specified previously.
 - b. Non-conformance with approved samples.
 - c. Non-conformance to specified fabrication or installation tolerance.
 - d. Damage beyond satisfactory field repair, as determined by the Architect.

3.03 CLEAN-UP

General

- A. Perform cleaning procedures as recommended by FRP unit manufacturer.
- B. Clean soiled FRP surfaces with detergent and water, using soft fiber brushes and sponges, and thoroughly rinsed with clean water.
- C. FRP material being painted in the field by others is to be prepared as specified in the project specifications.

3.04 PROTECTION OF INSTALLED FABRICATIONS

- A. Comply with manufacturer's recommendations and instructions for protecting installed Fabrications during constructions activities.

END OF SECTION