

SECTION 06 20 13 GLASS FIBER REINFORCED CONCRETE (GFRC)

1.0 GENERAL

1.1 SECTION INCLUDES

- A. Furnish all materials, labor, equipment and services necessary for the supply of GFRC components as indicated on the drawings and contract documents, all in compliance with local codes and/or ordinances.

1.2 RELATED SECTIONS

- A. Section 03 49 00 Glass Fiber Reinforced Concrete
- B. Section 06 10 00 Rough Carpentry - for connection attachment to structural wood framing.
- C. Section 05 12 00 Structural Steel - for connection attachment to structural steel framing.
- D. Section 07 90 00 Joint Protection - for joint sealants and expansion control.

1.3 INTENT

- A. This specification is intended to generally outline the requirements of the GFRC components, as they pertain to the overall project design. In all cases, the Manufacturer's printed specifications shall govern the work of this section.

1.4 RESPONSIBILITY

- A. The Installing Contractor shall install the work under this section and he will be responsible for coordinating the installation with other trades.

1.5 SUBMITTALS

- A. Submit 3 GFRC flat samples to the Architect for his review.
- B. Submit shop drawings for approval showing plans, sections, details, joint treatment, reinforcing, fastening devices and the relation of the GFRC components to the surrounding construction.

1.6 SUBSTITUTIONS

- A. Manufacturers desiring to submit proposals other than ours shall, at least 10 days prior to the bid date, submit to the Architect all descriptive information of the system. These Manufacturers must have a minimum of three years experience with the system and provide photographs and shop drawings of at least three projects similar in detail and scope with names, addresses and phone contacts of the respective Architects and Installation Contractors. Independent test data showing compliance with the specified system and three samples of similar details must also be submitted.

1.7 MOCK-UP

- A. Prior to production erect one proto-type component on-site or at the plant, for review by the Architect. Once approved the proto-type will establish the standards by which the work will be judged.

2.0 PRODUCTS

2.1 MANUFACTURER

MADE COMPOSITES INC.
228, Toryork Dr. Toronto ON - M9L 1Y1 - CANADA
Phone: 416-745-5674 - Fax: 416-745-6194

2.2 MATERIALS

- A. GFRC components shall be asbestos free and prefabricated with Portland cement, polymers, aggregates, and reinforced with alkali resistant chopped strand fibers.
- B. GFRC components shall be suitably reinforced with steel.
- C. Fabrication will be as per approved shop drawings and will not include framing or assembly. If multiple components are required to complete design criteria as per contract drawings, additional site work under related sections, installation or finishing may be required.
- D. FINISH:
 - Option 1. Smooth no primer
 - Option 2. Smooth primer finish
 - Option 3. Smooth primer and custom color paint finish

2.3 TOLERANCES (FABRICATION)

- A. Dimensional - all directions $\pm \frac{1}{8}$ " (3mm)
- B. Thickness - Shell $\pm \frac{5}{16}$ " (8mm)
- C. Warping or Bowing $\pm \frac{1}{16}$ " per foot (1.5mm per 0.305m)

Site conditions and normal manufacturing variations may require additional site work to maintain these tolerances.

2.4 PHYSICAL PROPERTIES

- A. Reference - ASTM International (ASTM)

- 1. C947 Standard Test method for Flexural Properties of Thin Section Glass Fiber Reinforced Concrete
- 2. E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- 3. Shell Thickness $\pm \frac{5}{16}$ " (± 8 mm)
- 4. Weight (depending on shape and reinforcement) 4 - 7 lbs/sq.ft (1.8 - 3 Kg/0.093sq.m)
- 5. Density 130 - 140 lbs/cu.ft (59 - 63.5 Kg/0.028m³)
- 6. Fuel Contribution (ASTM E-136-98a) 0
- 7. Flame Spread (ASTM E-84-98) 0, Class A
- 8. Smoke Index (ASTM E-84-98) 0, Class A
- 9. Resistance to Weathering (ASTM G-23-93) Class 5, Negligible color alteration
- 10. Screw Withdrawal (standard lab procedure) 346 lbs (157 Kg)
- 11. Fiber Content 5% - 6% by weight

2.5 INSPECTION

The Architect or his representative shall have access to the manufacturing facilities, either prior to contract award or thereafter, to inspect or verify compliance with the above specifications.

3.0 EXECUTION

3.1 PRE-INSTALLATION RESPONSIBILITY

- A. Field Measurements: Prior to manufacturing, the Installer will be responsible for obtaining all field dimensions for inclusion on the Manufacturers shop drawings.
- B. Co-Ordination: The Installer will be responsible for the co-ordination of the installation with related sections, within the tolerances specified in the respective articles.
- C. Discrepancies: Prior to installation, the Installer shall check job site dimensions and conditions. Any discrepancies between design and field dimensions shall be brought to the attention of the General Contractor and the Architect.

3.2 DELIVERY, STORAGE, HANDLING AND PROTECTION

- A. Transport and handle units in a manner that avoids excessive stresses or damage.
- B. Components displaying obvious damage must be rejected at site at time of delivery.
- C. Store the components in a controlled environment, protected from the elements, on a level surface, with temporary supports as required. Do not stack or lean.

3.3 INSTALLATION

- A. Components shall be lifted/handled with suitable devices.
- B. Handle units with clean gloves.
- C. Components shall be installed plum and true. Shim where necessary.
- D. Pre-drill and countersink to 1/8" (3mm) minimum below finished surface of unit if required.
- E. Fasten components with stainless steel fasteners through embedded steel or face of GFRC as indicated on shop drawings.
- F. Use PL Premium construction adhesive where indicated on shop drawings.
- G. Where components are suspended, use as a minimum 12 gauge galvanized steel wire and the suspension points indicated on the shop drawings.
- H. Allowable variation in material thickness at surface suspension points shall not Exceed $\pm 1/4$ " (6.35mm).
- I. Framing, hangers, etc., as specified elsewhere.
- J. Butt joints are to be caulked as specified under Sealants and Caulking.

3.4 PATCHING AND CONTROL JOINTS

- A. Introduce control joints as required (35'-0" / 10.67m O.C.) under related section of the Specification.
- B. Patch any damage to match component texture, using only mix and sealer provided by the manufacturer.

3.5 CLEANING

- A. Clean components using soap & water. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.
- B. For painted GFRC, refer to painting specification.
- C. For integrally colored GFRC, use a light duty concrete cleaner.