

**SECTION 06 20 13
EXTERIOR FINISH CARPENTRY
(Factory-molded GFRC fabrications)**

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes furnishing all materials, labor, equipment, and related services necessary to supply and install molded glass fiber reinforced concrete (GFRC) units as indicated in the contract documents, and in compliance with applicable codes.

1.02 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.

1.03 REFERENCES

- A. 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

1.04 SUBMITTALS

- A. Product Data: Submit product data sheets for each specified product.
- B. Samples: Submit representative samples of the color and texture of GFRC material(s) as selected by the Architect or Designer.
- C. Shop Drawings: Submit drawings for approval showing plans, sections, details, joint treatment, reinforcing, fastening devices and the relation of the GFRC parts to the surrounding construction.

1.05 QUALITY ASSURANCE

- A. All GFRC parts to be provided by the same manufacturer using the same source of materials for the project.
- B. Manufacturer Qualifications: Manufacturer shall have a minimum of 5 years experience having successfully supplied GFRC parts for other projects similar in scope and complexity for the work of this Contract.
- C. Installer Qualifications: Installer shall have a minimum of 5 years experience having successfully completed projects of similar scope and complexity for the work of this Contract.
- D. Substrates to accept GFRC parts shall be installed straight and true within 1/8 in. in 8 linear ft. [3mm in 2500mm] and shall be free of obstructions and interference that prohibit the correct alignment and attachment of the GFRC parts.

- E. Where the work schedule permits, confirm dimensions and site conditions prior to manufacturing materials specified in this section. Any deviations from the design conditions or dimensions to be provided to the manufacturer for inclusion in the shop drawings

1.06 DELIVERY, STORAGE AND HANDLING

- A. Handle and transport GFRC parts to avoid damage. Place non-staining resilient spacers foam between parts and support parts during shipment.
- B. Parts shall be kept clean and dry and stored protected on firm, level and smooth surfaces to prevent distortion, warping, and other physical damage in accordance with the manufacturer's recommendations.
- C. Place stored panels so part identification labels are clearly visible.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Formglas Products Ltd. – Tel: 416-635-8030
Contact your local representative – www.formglas.com/representatives or send requests for quotations directly to estimating@formglas.com

2.02 GLASS FIBER REINFORCED CONCRETE (GFRC) PARTS

- A. Fabrications: Molded GFRC parts to be made without a steel panel frame backing in accordance with samples, contract documents and approved shop drawings.
- B. Part Thickness: GFRC parts to have a nominal shell thickness of 5/8" with the perimeter edges a minimum of 1" nominal thickness as detailed on the shop drawings.
- C. All GFRC parts to have labels affixed to the back individually indentifying them with the same part numbers used on the shop drawings.
- D. Materials:
 - 1. For all GFRC parts with integral color, use white Portland cement from the same source throughout the project;
 - 2. Alkali resistant glass fiber with a minimum Zirconium content of 16%;
 - 3. Silica sand washed and dried, complying with composition requirements of ASTM C144;
 - 4. Aggregate selected for hardness and durability, free of material that reacts with cement or causes staining.
 - 5. Polymer curing admixture to impart specific properties to the GFRC.
 - 6. Color pigments and/or admixtures to provide integral color throughout the material thickness to match the selected sample.
- E. Face Mix: Proportion the Portland cement, silica sand, aggregates and admixtures to comply with the face mix design requirements.
- F. Backing Mix: Proportion the Portland cement, glass fibers, silica sand, aggregates and admixtures to comply with the backing mix design requirements. Glass fiber content to be a minimum of 4% by weight of the total mix.
- G. Connection Hardware: Structural brackets or shapes used to support or attach GFRC panels to the structure to be fabricated from corrosion resistant metal of appropriate type and gauge for the application.

2.03 PHYSICAL PROPERTIES

- A. GFRC parts to have a Flame Spread Index = 0; and a Smoke Development Index = ≤ 25 when tested in accordance to ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.

- B. GFRC parts to have Tensile, Flexural, Compressive and other physical properties consistent with the ASTM Standards test data detailed with the product and/or technical data sheets provided.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Site Conditions: Verify the conditions for compliance with the manufacturer's requirements including installation tolerances and other conditions affecting the installation and performance of GFRC parts. Any unsatisfactory conditions to be corrected prior to installation.
- B. Field Dimensions: Field dimensions to be verified including those not shown on the drawings. Any discrepancies between design and field dimensions shall be brought to the attention of the Architect with resolutions to the discrepancies to be mutually agreed upon by all parties involved. Details of any required changes must be incorporated into the manufacturer's shop drawings prior to commencing the manufacture of the GFRC parts.

3.02 PREPARATION

- A. Substrate: Substrates to accept GFRC parts, provided by others, shall be installed straight and true within 1/8 in. in 8 ft. (3mm in 2500mm) and shall be free of obstructions and interference that prohibit the correct attachment of GFRC parts.
- B. Structural framing members, provided by others, shall be of the proper size, spacing and design for the intended use and shall be sufficient to properly support the installed GFRC parts.

3.03 INSTALLATION

- A. Install in accordance with the manufacturer's instructions, contract documents and shop drawings.
- B. It is the Installer's responsibility to verify scope of work and to order the correct quantities of components (including a waste allowance).
- C. Supply and install clips, hangers, and other accessories required for the secure attachment of the GFRC parts to the support members and back-up materials.
- D. Position GFRC parts carefully into place plumb, level and aligned with adjacent parts and materials in accordance to the shop drawings.
- E. Provide temporary supports or bracing as required to maintain position, stability and alignment of parts until permanently secured.
- F. Provide joint spacing between parts as detailed for expansion and the application of joint treatment materials.
- G. Complete joint treatment, patching and cleaning in accordance to the manufacturer's recommendations. Plan in advance to secure Architect approval for any use of color matching caulk (to be supplied by the installer).

3.04 CLEANING AND PROTECTION

- A. Perform cleaning procedures, if necessary, according to GFRC manufacturer's written instructions. Prevent damage to GFRC surfaces and staining of adjacent materials.

END OF SECTION

Note to Specifiers: Depending on the nature of the construction project and other related work to be carried out, Formglas® GFRC-L (Factory-molded GFRC fabrications) may be specified in other MasterFormat sections. For example, Section 03 49 00 Glass Fiber Reinforced Concrete. Delete this note.