



# GEORGIA PRECAST SOLUTIONS

## Specifications for Insulated Glass Fiber Reinforced Concrete (IGFRC) – Section 033452

### PART I – GENERAL

#### 1.1 WORK INCLUDED

- A. Provide and install all Insulated GFRC elements for this project as indicated in architectural drawings.
- B. Related Requirements:
  - 1. Section 033000 “Cast-in-Place Concrete” for embedding weld plates and angles in concrete for attaching connection devices.
  - 2. Section 051200 “Structural Steel Framing” for attaching connection devices to steel framing.
  - 3. Section 079200 “Joint Sealants” for elastomeric joint sealants and sealant backings.

#### 1.2 DEFINITIONS

- A. Design Reference Sample: Sample of Insulated GFRC color, finish, and texture that has been preapproved by Architect before execution of the Contract.
- B. Design Reference Sample: < Insert description and identify manufacturer and product code number of sample >.

#### 1.3 QUALITY ASSURANCE

- C. Manufacturing plant shall have a written Quality Control manual on file at date of bid.
- D. Manufacturer must have minimum 5 years experience in successfully producing Insulated GFRC and provide names and contact information of architect, general contractor, and installer for 5 projects of equivalent or greater scope.
- E. All attachment methods for Insulated GFRC are to be independently tested by a registered engineer. Provide testing reports as requested. Testing should be done with actual composite material being used on the project as indicated in the manufacturer shops drawings.
- F. Specific stamped engineer drawings specific to this project are to be available for a fee.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at project site: < Insert Address >.

#### 1.5 SUBMITTALS

- A. Sample of Georgia Precast Solutions Insulated GFRC: Submit sample(s) of Insulated GFRC work, using materials as specified, indicating finish and color to be expected for this project. Approved sample shall provide standard of quality for all Insulated GFRC profiles in this project. Provide Insulated GFRC samples that conform to requirements as specified in this section.

B. SHOP DRAWINGS

Provide shop and setting drawings, indicating jointing, fabrication details, setting details, and location of pieces. Each stone shall be identified with a setting coordinate number, unique for this project, so indicated on the shop drawings.

C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

1. Build mockup of typical wall area as shown on architectural drawings which include typical components, attachments to building structure, and methods of installation.
2. Include window opening with Insulated GFRC returns.
3. Include sealant-filled joint in compliance with requirements in Section 079200 "Joint Sealants."
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FABRICATION

Fabrication of Insulated GFRC shall be in accordance with approved shop and setting drawings signed by architect or owner.

1.7 HANDLING AND STORAGE:

Insulated GFRC pieces shall be palletized and covered to protect the pieces while in transit. Upon arrival at the job site, all Insulated GFRC pieces shall be inspected prior to unloading and damaged or inferior stones returned to the manufacturer by the delivering vehicle or truck.

1.8 STORAGE:

Store Insulated GFRC pieces on platforms to protect from contact with the soil. Cover to protect against the weather if stored with tarps of other materials. Protect Insulated GFRC pieces to prevent chipping, staining, and other damage until ready for application. Product should be stored on a level surface.

**PART II – Products**

2.0 Manufacturer:

Georgia Precast Solutions LLC  
1324 Southern Road  
Morrow, GA 30260  
(770) 960-6797  
[www.georgiaprecast.com](http://www.georgiaprecast.com)  
[info@georgiaprecast.com](mailto:info@georgiaprecast.com)

2.1 MATERIAL COMPOSITION:

Georgia Precast Solutions Insulated GFRC is a unique blend of natural minerals, special bonding agents, and other proprietary ingredients including Portland cement as a base element for strength. Cast in approved production facility over minimum 1.25# density EPS.

## 2.2 SETTING MATERIALS:

- A. All adhesive to be provided by casting manufacturer having been specifically tested by an independent engineer for use with Insulated GFRC.
- B. All track for connection shall be G90 electro-galvanized in gauge as required by testing guidelines established by an independent engineer. Minimum gauge for any application is to be 20.
- C. If embedded clips or tie wire are to be used, they must be stainless steel. Tie wire to be minimum 14 gauge

## 2.3 PHYSICAL PROPERTIES TO MEET THE FOLLOWING CRITERIA:

- A. Testing to be performed by an independent laboratory for all the criteria listed below.
- B. Manufacturer shall determine maximum piece size and support with in-house testing that displays the products ability to handle movement caused by deflection, wind, thermal shock (-10 degrees to 90 degrees in 4 hours).
- C. Minimum thickness of composite panel based on size and shape of piece, generally 1-1/2" to 3". Contact Georgia Precast for specific size requirement for a specific project.
- D. Georgia Precast Insulated GFRC shall be lightweight (6.5# to 10# pounds per square foot surface area dependent on size/depth of piece. Material alone at 1/2" thickness weighs 5#'s per square foot.
- E. Finish
  - 1. Color as selected by Architect from Georgia Precast's standard color chart.
  - 2. Finishes to be selected from below:
    - A. Standard Finishes**
      - a. Light Sandblast
      - b. Medium Sandblast
      - c. Acid Wash
      - d. Sanded
    - B. Premium Finishes**
      - e. Polished
      - f. Burnished
      - g. Exposed
      - h. Aged
      - i. Stained
      - j. Metallic Paint
- F. Independent testing for cast material shall be current to within 1 year from production of product.

Test Method	Property	Age	Average Test Result
ASTM C109	Compressive Strength (psi)	24 hrs	2,810
		7 days	6,060
		28 days	6,660
ASTM C307	Tensile Strength (psi)	7 days	555
		28 days	595
ASTM C947	Flexural Strength (psi)	7 days	620
		28 days	735
ASTM C348	Flexural Strength (psi)	24 hrs	785
		7 days	905
		28 days	1,285
ASTM C1583	Tensile Bond Strength (psi)	28 days	20 (100% Substrate Failure)
ASTM C157	Length Change - Air Cured (% Change)	28 days	-0.135
ASTM C666	Freeze/Thaw Durability (Relative Dynamic Modulus, %)	300 Cycles	100
ASTM C666 per C1364 *All sides are saw cut to expose aggregate	Freeze/Thaw Durability (Relative Dynamic Modulus, %)	300 Cycles	100
ASTM C666 per C1364 *All sides are saw cut to expose aggregate	Freeze/Thaw Durability (CPWL, %)	300 Cycles	0
ASTM C642/C1195	Absorption - Cold Water (%)	28 days	5.8
	Absorption - Boiling Water (%)		9
	Apparent Density		2
	Permeable Voids (%)		16.6

ID	Sample Diameter (in.)	Bond Area (in <sup>2</sup> )	Peak Pull Off Load (lbf.)	Bond Strength (psi)	Failure Type	Avg Bond Strength (psi)
#1	2.00	3.14	581	<b>185</b>	Brick to Matrix Bond	181
#2	2.00	3.14	503	<b>160</b>		
#3	2.00	3.14	623	<b>198</b>		

ID	Sample Diameter (in.)	Bond Area (in <sup>2</sup> )	Peak Pull Off Load (lbf.)	Bond Strength (psi)	Failure Type	Avg Bond Strength (psi)
#1	2.00	3.14	64	<b>20</b>	Brick to Foam Bond	20
#2	2.00	3.14	60	<b>19</b>		
#3	2.00	3.14	69	<b>22</b>		

G. Materials – ASTM Test Data:

- A. Portland Cement: ASTM C 150, Type I or II. White and/or gray as required to match specified color.
- B. Coarse Aggregates: ASTM C 33, Current graduation concrete.
- C. Core: ASTM C 578, Expanded polystyrene, minimum of 1# Type I.
- D. Admixture: ASTM C 494, High range water reducer.

- 2.4 All Insulated GFRC pieces shall be shipped by the manufacturer/fabricator taking the Necessary precautions to protect the stone while in transit. Upon arrival, all Insulated GFRC pieces shall be inspected prior to unloading and damaged and inferior stones/pieces returned to manufacturer by returning vehicle. All Insulated GFRC pieces shall be stored at the job site in such a manner as to protect it from chipping, staining, and other damages until ready to use.

**PART III – Execution**

- 3.1 SETTING – Per architects approved set of manufacturer’s shop drawings.
- 3.2 Products to be installed by an installation company with 5 years of experience in setting Architectural precast, cast stone, GFRC, or Insulated GFRC. Installer must have completed 5 projects of similar or greater scope.
- 3.3 All Insulated GFRC pieces shall be set according to drawings.
- 3.4 (Optional) A surface sealer must be applied at plant or post installation.
- 3.5 All expansion and piece joints should be treated with backer-rod and sealant approved for use with cement-based products.
- 3.6 If Insulated GFRC is to go over an air-weather barrier, air-weather barrier must be liquid Applied and approved and tested by installation contractor or air-weather barrier Manufacturer or an independent engineer. Contact Georgia Precast for a current list of Approved liquid applied barriers.
- 3.7 Coordination of waterproofing and air-weather barrier, installation methods and Sequence to be established in pre-construction meeting before production of Insulated GFRC products are begun.
- 3.8 All Insulated GFRC pieces shall be protected from splashing mortar or damage by other trades. Any foreign matter splashed on the stone should be removed immediately.
- 3.9 Insulated GFRC is not designed to be walked on or used as a stage for performing other work trades.

- 3.10 Insulated GFRC is not designed to be used to support window washing equipment or any type of swing staging.
- 3.11 Insulated GFRC shall not be used to anchor other products unless written permission is provided by manufacturer. Insulated GFRC can be blocked out or field cut to allow products to pass through and be attached to structure behind. Penetrating fasteners shall not bear on the Insulated GFRC panel. Contact manufacturer about the use of epoxy to fasten to Insulated GFRC shapes.
- 3.12 Minimum wall deflection to be L/360 unless otherwise indicated on drawings.
- 3.13 See list of approved substrates by manufacturer displaying testing of adhesive and mechanical attachment exceeding 180 MPH winds via a transverse wind-load test conducted by an independent engineer.
- 3.14 Inspection of finished product to follow Cast Stone bulletin 36.
- 3.15 Dimensional Tolerances of finished units: Provide in accordance with PCI MNL-117 and PCI MNL-128.
- 3.16 Tolerances and Erected Units:  
Overall, Height and Width of Units, measured at the Face Adjacent to Mold as follows:
  - a. 10 feet (3 m) or under, plus/minus 1/8" (3 mm).
  - b. Panel Depth from Face of Skin to Back of Panel: plus/minus 1/4" (6 mm).
  - c. Angular Variation of Plane of Side Mold: plus/minus 1/16" per 4 inches (1.6 mm Per 102 mm) of depth or plus/minus 1/8" (3 mm) total, whichever is greater.
  - d. Variation from Square or Designated Skew (Difference in Length of Two Diagonal Measurements): plus, or minus 1/8" per 72 inches (3 mm per 1800 mm) or plus/minus 1/4" (6 mm) total, whichever is greater.
  - e. Maximum Permissible Warpage of one corner out of the plane of the other three: 1/16" per 24 inches (1.5 mm per 300 mm) of distance from nearest adjacent corner.