



# BUFFALO

ARCHITECTURAL  
CASTING INC

## GFRC SPEC SHEET

### Part 1 - General

#### 1.1 GENERAL PROVISIONS

- A. Perform work of this section in accordance with the general conditions, supplemental conditions, general conditions, general requirements, drawings, and all other requirements of the contract documents.
- B. Glass Fiber Reinforced Concrete is referred to as GFRC further in this section.

#### 1.2 WORK INCLUDED

- A. Furnish all labor, materials, tools, and equipment necessary to complete the work of this section as shown on the contract documents.

#### 1.3 INSTALLERS QUALIFICATION

- A. Work under this section shall be performed by a firm having a minimum of 5 years of recent experience in GFRC replacement
- B. Obtain GFRC units where required from an established specialty plant with a minimum of 15 years of experience and having the capacity and facilities for producing matching units of specified quality and finish and in sufficient quantity so as not to delay the work progress. Plant to be recognized as a manufacturer in the industry of this type of material and shall show successful completion of work of comparable quality and scope.

#### 1.4 SHOP DRAWINGS, SAMPLES AND LITERATURE

- A. Submit certifications and test results to demonstrate that the materials and units conform to specifications.
  - 1. Test Boards will be made for every 50 pieces or less.
  - 2. For each test board, determine:
    - a. Glass Content by "wash out test"
    - b. Flexural Yield Strength
    - c. Flexural Strength

3. Keep quality control records available for two years after delivery of product.

B. Submit manufacturers shop drawings for review and approval by the Architect. Show production details, construction of each different GFRC unit, dimensions, and relationship to adjacent material in sufficient detail to cover the manufacture, handling, and installation. Show detail of sections and connections for fastening the GFRC units, identify anchorage, flashing, counter flashing, and accessory items. Photographs may supplement drawings. Indicate color and texture different parts of installation.

C. Submit samples of the finish material together with drawings and details as required to obtain approval of the architect. Do not proceed with fabrication prior to completed review and approval of drawings and approval of material samples.

#### D. Samples

1. Prior to beginning of fabrication, submit samples to represent finished exposed face, showing typical range of color and texture for architects approval. Sample may have to match the surface of an original stone selected by the architect and submitted by the contractor.
2. Sample size: Approximately 6" x 6" and of appropriate thickness, representative of the proposed finished product.
3. Acceptance of samples shall establish a standard of workmanship and finishing of surfaces, and are to be used throughout the remainder of the project. No work shall commence on the installation of the GFRC until all appropriate samples have been reviewed.

### 1.5 DELIVERY STORAGE AND HANDLING

A. All materials shall be delivered to the site safely wrapped packed and labeled. B. Materials shall be stored in a dry location off of the ground, to prevent damage. C. All GFRC products are to be delivered in a protective wrapping to remain in place until installation. Products are to be handled in a way to prevent damage during shipping. D. GFRC Products are to generally match samples when seen in daylight from a 20 foot distance.

## PART 2 - PRODUCTS

### 2.1 MATERIALS:

A. Obtain materials for GFRC replacements from a single source for each type of required replacement unit to ensure match of quality, color, pattern, and texture.

1. Acceptable Manufacturers

Buffalo Architectural Casting  
(716) 885 - 9020  
315 Hinman Avenue, Buffalo NY, 14216

Stone Details LLC  
(802) 655 - 0458  
Williston, Vermont 05495

Or equivalent

B. Materials shall be of the following makes, brands and any kinds, or approved equals as determined by the architect.

1. Portland Cement:
  - a. ASTM C150, Type I or III
  - b. For surfaces exposed to view in the finished structure, use same brand type and source of supply throughout the GFRC production.
2. Aggregates:
  - a. Sand shall be washed and dried silica or approved equal with a history of successful use in GFRC. All sand shall pass through a size 16 sieve.
3. Water shall be free from deleterious matter that may interfere with the appearance or strength of the concrete.
4. Glass Fiber:
  - a. Fibers specifically designed to be compatible with the aggressive alkaline environment of Portland cement based composites or fibers with a history of successful use in a Portland cement based composite that has been modified to be compatible with the fiber.
  - b. The fabricator shall submit on request, evidence that the glass composition, Portland cement matrix, or both have been designed for glass fiber reinforced concrete applications.
6. GFRC Mix:
  - a. GFRC shall consist of Portland Cement, water, glass fibers, sand, and may contain admixtures. The component materials shall be in accordance with the above GFRC mix and shall have the same color as the facing mix.

b. Normal glass content shall be not less than 3% percent and average yield and ultimate strengths shall not be less than 900 and 2,500 psi respectively.

7. Facing Mix: shall be the same as GFRC mix with exception that no glass fibers shall be in the facing mix.

8. Coloring Agent: The amount of coloring agent shall not exceed 10% percent of cement weight.

9. Metal products: All new steel used in the assembly and anchorage of GFRC units shall be stainless steel or approved equal.

## PART 3 - EXECUTION

### 3.1 GENERAL REQUIREMENTS:

A. All materials shall be installed and applied in accordance with the manufacturer's specifications for same as indicated on drawings.

B. Manufacturer's specifications shall be submitted to the Architect prior to the work and shall become part of this section.

C. Protect stored material from contact with earth and keep covered until used to prevent inclusion of moisture.

D. Protect work in progress from weather, dehydration, and damage. Cover incomplete work until progress is resumed.

E. The Contractor shall apply suitable measures to ensure that the rainwater does not infiltrate through the incomplete work to the interior of the building.

F. Prior to the manufacture and installation of GFRC units, the Contractor shall verify and coordinate all dimensions affecting all work under this section.

G. Contractor shall be solely responsible for all field dimensions, appropriate fit of new GFRC units, etc.

E. Any discrepancies which could adversely affect installation in strict accordance with the contract documents shall be brought to the attention of the Architect. If such conditions exists, installation shall not proceed until they are corrected or until installation requirements and details are modified.

F. Cooperate in the coordination and scheduling of the work of this Section with the

work of other sections so as not to delay job progress.

### 3.2 MODELS AND MOLDS:

Make, models, and molds required to produce the finished units ready for installation:

1. Molds for GFRC units shall be either rubber or rigid and constructed of materials that will result in finished products conforming to the profiles, dimensions, and tolerances indicated by the approved shop drawings.
2. Release agents, shall be applied and used according to the manufacturer's instruction. Form release agents shall be completely removed or be of the type which will not cause future discoloration or inhibit bond of mortars or sealants.

Proportioning and Mixing:

1. All measurements of mix constituents shall be carried out in a careful manner to achieve the desired mix proportion.
2. If in the event of spray-up methods, the glass fiber, polymer compound, and cement slurry shall be metered to the spray head at rates to achieve the desired mix proportion and glass content.
  1. Spray operators and casting personnel shall be trained and experienced.
  2. A face coat consisting of the matrix without fiber may, if necessary be sprayed or brushed on to the form. The thickness of this coating shall generally not exceed 1/16" in order to avoid an unreinforced surface.
  3. Spray-up or hand packing of the main body of material shall proceed before any mist coat or facing mix has set.
  4. Application shall be by spraying or hand packing such that uniform thickness and distribution of glass fiber and cement matrix are achieved during the application process.
  5. Consolidation shall be by rolling or such other techniques as necessary to achieve encapsulation of fibers and compaction. 6. Control of thickness shall be achieved by using pin gage or other approved method.
7. All hand forming of intricate details, incorporation of formers, or infill material, and over spraying shall be carried out before the material has achieved its initial set so as to ensure complete bonding.

#### Curing:

1. Immediately after the completion of spraying of the panel, a curing method shall be used to insure sufficient strength for removing the using form.
2. After initial curing, remove panel from form and place in a controlled curing environment. An acrylic thermoplastic copolymer dispersion will be used as an admixture. Only copolymers shown to eliminate the need for moist curing through published independent laboratory test dated shall be used.

#### Finishes:

1. Exposed face of replica units to match approved sample on file in Architect's office. The exposed face of the panels or units shall be manufactured free from joint marks, "grain" or other obvious defects.  
Surface patches and repairs, if required, shall match the surrounding finish.

#### Acceptance:

1. GFRC units, which do not meet the color and texture range or the dimensional tolerances, may be rejected at the option of the Architect if they cannot be satisfactorily corrected.

#### 3.3 INSTALLATION:

##### General (See also Paragraph 3.5 of this Section)

1. The installation of the new GFRC units shall be carried out by stone masons of proved capability and shall be the complete responsibility of the Contractor. It shall also be the complete responsibility of the Contractor to coordinate delivery, storage, and erection of the units with other job site operations.
2. The Contractor shall submit to the architect the method and procedures proposed for the installation.
3. New GFRC units shall be handled with care during plant loading, shipment, site unloading, site storage, and site erection. Corners, edges, and projecting lips shall receive additional care and protection.
4. New GFRC units which are stored at the site shall be covered until ready to use. Each new GFRC unit shall be carefully numbered and identified in

accordance with the approved drawings. Identification marks shall not appear on any exposed faces.

6. Set each unit in the position to which it is assigned in accordance with the approved drawings, complete with all anchoring devices and shims. If necessary, units shall be secured in place temporarily with approved fastening devices. Carefully place all units to insure that all units are in the proper position and plan.

7. Necessary precautions shall be taken to protect all GFRC units from damage during and after erection. Wedges, spacers, and other setting devices that are likely to cause staining shall be removed promptly.

8. All GFRC units shall be erected, level, plumb, square, and true within the allowable tolerances, the units are to be positioned in such a manner that no dimensional error is allowed to occur. Horizontal and vertical joints shall be correctly aligned and uniform joint width shall be maintained as erection progresses. Plastic shims are placed at the bed joints to assure proper joint size. The shims must be left projecting past the face for each removal after block grouting. Shims should be removed after grouting but prior to pointing.

#### 3.4 WORKMANSHIP FOR THE INSTALLATION OF NEW GFRC UNITS:

A. All new cast GFRC units shall be installed in accordance with methods and procedures as shown and detailed on the approved shop drawings.

#### 3.5 CLEAN-UP:

A. As the work progresses, remove excess materials and clean adjoining surfaces as may be required to properly complete the work and keep the site clean.

B. At the conclusion of the work, remove all scaffolding and equipment use in the work, clean up all debris and surplus material and remove same from the premises.