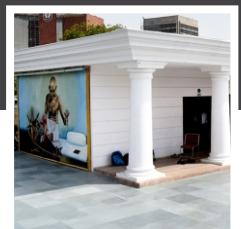
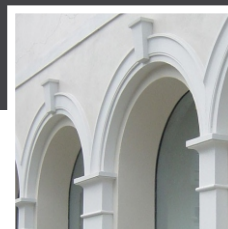
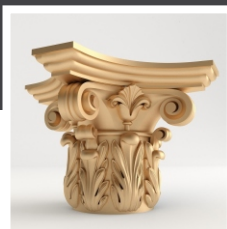


- ARCHES
- BRACKETS
- BANDS & PANELS
- BALUSTERS & RAILINGS
- COLUMNS & CAPITALS
- DECORATIVE MURALS
- FINS
- MOULDINGS & CORNICES
- PLANTERS / LANDSCAPES
- SCREENS





swastik

 GRC AND FRP Components Pvt. Ltd.

DURABLE ARCHITECTURAL EXTERIOR CLADDING

MAKE BUILDING BEAUTIFUL

INTRODUCTION TO GRC/GFRC

(Glass Reinforced Concrete)

Glass Reinforced Concrete (GRC), also referred to as Glass Fiber Reinforced Concrete (GFRC) and Fiberglass Reinforced Concrete (FRC). Since its introduction, GRC has become extremely popular as a versatile building materials among the Architect and Design industry.



✦ GRC has been making a significant contribution to the technology and aesthetics of modern construction worldwide for over 40 years.

✦ GRC is a composite material made of cement, fine aggregates, water, chemical admixtures and alkali resistant (AR) glass fibres, which can be engineered to suit a wide range of applications.

✦ GRC is also most suitable for seismic regions as GRC has a tendency to bend and not crack under seismic pressure.

✦ The design and manufacture of GRC products is covered by international standards, which have been developed in Europe, America, Asia and Australia. GRC is manufactured in over 100 countries.



KEY FEATURES

- GRC can be cast into fine details
- GRC offers designers unrivalled flexibility
- GRC mouldings & features are easy to handle and fast to erect.
- GRC does not suffer from corrosion
- GRC is environmentally friendly
- GRC is durable against extreme weather conditions
- GRC is easily molded to reproduce shapes, details and textures
- GRC can be coloured with pigments, paints and natural stone facings
- GRC offers a wide variety of shapes and surface finishes

GRC – EXTERIOR CLADDING

ADVANTAGES	BENEFITS
Light Weight	Faster installation & savings in superstructure and foundations
High Strength	Hard and dense surface offers resistance to graffiti
High Impact Resistance	Minimizes breakages during transportation and erection.
Durable	Low maintenance & never rots or corrodes
Choice of Colour / Texture	Plain White & Natural earthen colours can be manufacture by adding pigment on mixed design. Plain smooth & acid wash finish(Stone Finish). GRC can be painted with any available colours manufacture by paint companies
No steel reinforcement	So, no electromagnetic interference with signaling cables
No Health Risk	AR glass fibre is irrespirable unlike asbestos fibre
Easy Fixing	Drying fixed with M.S. fixtures/Stainless steel

GRC APPLICATIONS

CLADDING – Can be Plain, Textured, Curved or with Bands

ORNAMENTAL / ARCHITECTURAL COMPONENTS:

- | | | |
|-----------------|---------------------------------|------------------------|
| (a) Arches | (e) Cornices | (l) Partitions |
| (b) Bands | (f) Columns, Capitals and Bases | (j) Window surrounding |
| (c) Brackets | (g) Domes | (k) Zharokhas |
| (d) Balustrades | (h) Fins and Parapets | |

LANDSCAPING AND GARDEN FURNITURE:

- (a) Landscape element such as planters / flower pots
- (b) Garden furniture's
- (c) Lamp posts
- (d) Bollards, Signs, Statues and Sculptures.



TECHNICAL / CIVIL ENGINEERING APPLICATIONS

Noise Barriers

The weight per unit of GRC or its surface mass, stiffeners provides a property of noise insulation at lower frequencies. Typical 10mm thick GRC having surface mass 20Kg / M² will have an average sound reduction of about 30 decibel.

GRC Replacing RCC

Long but lightweight element, which greatly reduces the load on the building, can be made.

DESIGN CRITERIA

An understanding of basic molding and casting constraints of glass fiber reinforced concrete will provide a better understanding for the architect and engineer of how GRC design shapes and forms are to be manufactured. Here are some designs considerations that may affect the cost of GFRC used in your project. GFRC can reproduce intricate details or smooth sweeping curves. Details and undercuts require rubber mold liners. Simple smooth flats and curves can be cast in rigid molds of fiberglass. While rubber molds are slightly more expensive, the cost may be minimal if the casting is repeated several times. Numerous casts of a GFRC shape are more economical per piece, than onetime-only casts.

GFRC can be cast in pieces up to 12' in length. Maximum area 60-80 Sq. Ft & depends on design & thickness. However, the longer the length, the more difficult it is to handle and ship the GFRC casting.

We recommend a maximum area 60 to 80 Sq. Ft depends on design & thickness for most moldings. If longer lengths are required, pieces can be field joined.

QUALITY ASSURANCE

The success of any GFRC system depends on a coordinated effort by the designer, manufacturer and installer. Sequence, deliveries and manufacturing tolerances are critical to the success of the project and should be mutually agreed upon by all parties. Submittals and shop drawings should be utilized extensively to familiarize the designer and installer with the method of attachment, reinforcement and fabrication. This process alerts the designer to any possible conflicts. The GFRC shop drawings should be complete in every detail to allow the installing contractor a complete inventory of parts and pieces, as well as expected tolerances.

JOINTS

We suggest avoiding Joint filling by making GRC with V grooves or open joint Joints in GRC serve an aesthetic and functional purpose. Typically, GRC joints are sealed with an elastomeric sealant such as silicone/PU. Sealants should be able to withstand dimensional changes, both within the product, and due to building movement. Good joint design should direct water away from the joints, protect the sealant from direct exposure to sunlight and, if economically feasible, provide a secondary line of defense and a drainage method. Preparation of joints, including primers, backer rods and application of sealant should follow Erection Tolerances It should be the contractor's responsibility to ensure that all components of the GRC system are installed reasonably level, plumb, straight, or curved as designed and specified.



CLEANING AND REPAIRS

It is always better to avoid getting dirt or staining materials on the GFRC to begin with. A little care is keeping the GFRC material clean before and during installation will be worthwhile. Stains from handling GFRC can generally be removed with common household cleaners such as dishwashing detergent and water. Repairs of chips, damaged edges or minor blemishes to GFRC are allowed. See instructions for patching GFRC (glass fiber reinforced concrete).

Properly made GFRC repairs will last the life of the GFRC material.

CONCLUSION

A properly designed, manufactured and installed GRC system will provide an innovative and aesthetically pleasing appearance, while often reducing overall cost, onsite labor requirements and shortening construction schedules.

Glass fiber reinforced concrete (GRC) offers an endless variety of decorative and ornamental shapes and forms at affordable prices.

Permeability of GFRC depends on the mix design and compaction and is better than most cementitious materials.

TYPICAL PROPERTIES OF GRC (at 28 days)

PROPERTY	UNIT	MACHINE SPRAY
Glassfibre (AR)	(WT. %)	2 to 5 depending upon component of GRC
Flexural Strength	Mpa	6-11
Compressive Strength	Mpa	35-65
Impact Strength	Kj/m ²	7-20

GRC MATERIAL PROPERTIES

Thickness	- 12 to 15mm (depending upon article)
Wt. / Sq. Ft.	- 2 to 4 kg (depending upon article)
Dry Density	1.8 to 2.2 T/M ³
Colour	Any earthen colour (popular colours are White & Pink)
Texture	(a) Plain Smooth Finish, (b) Painted, (c) Acid Wash (Stone Finish)

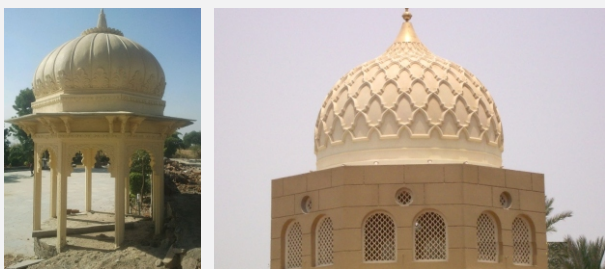
ARCHES



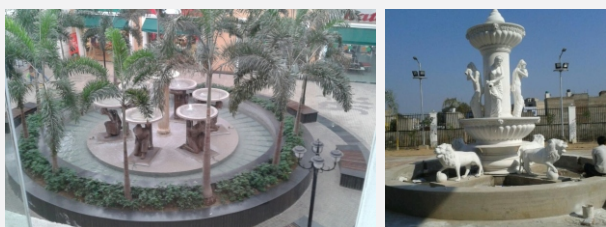
BRACKETS



DOMES



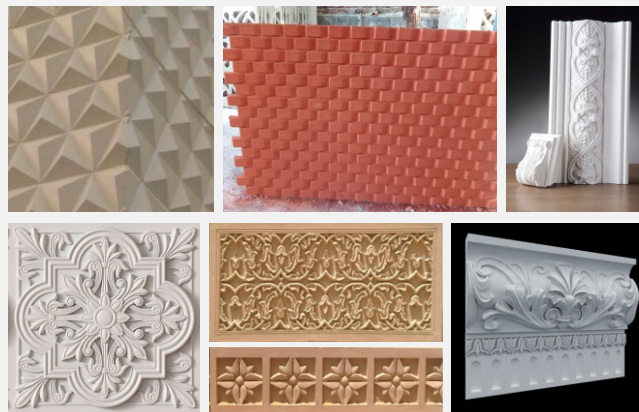
FOUNTAIN



BALUSTER & RAILINGS



BANDS & PANELS



COLUMN & CAPITAL



GRC NOISE BARRIERS



GRC V / OPEN JOINTS



MOLDING CORNICES



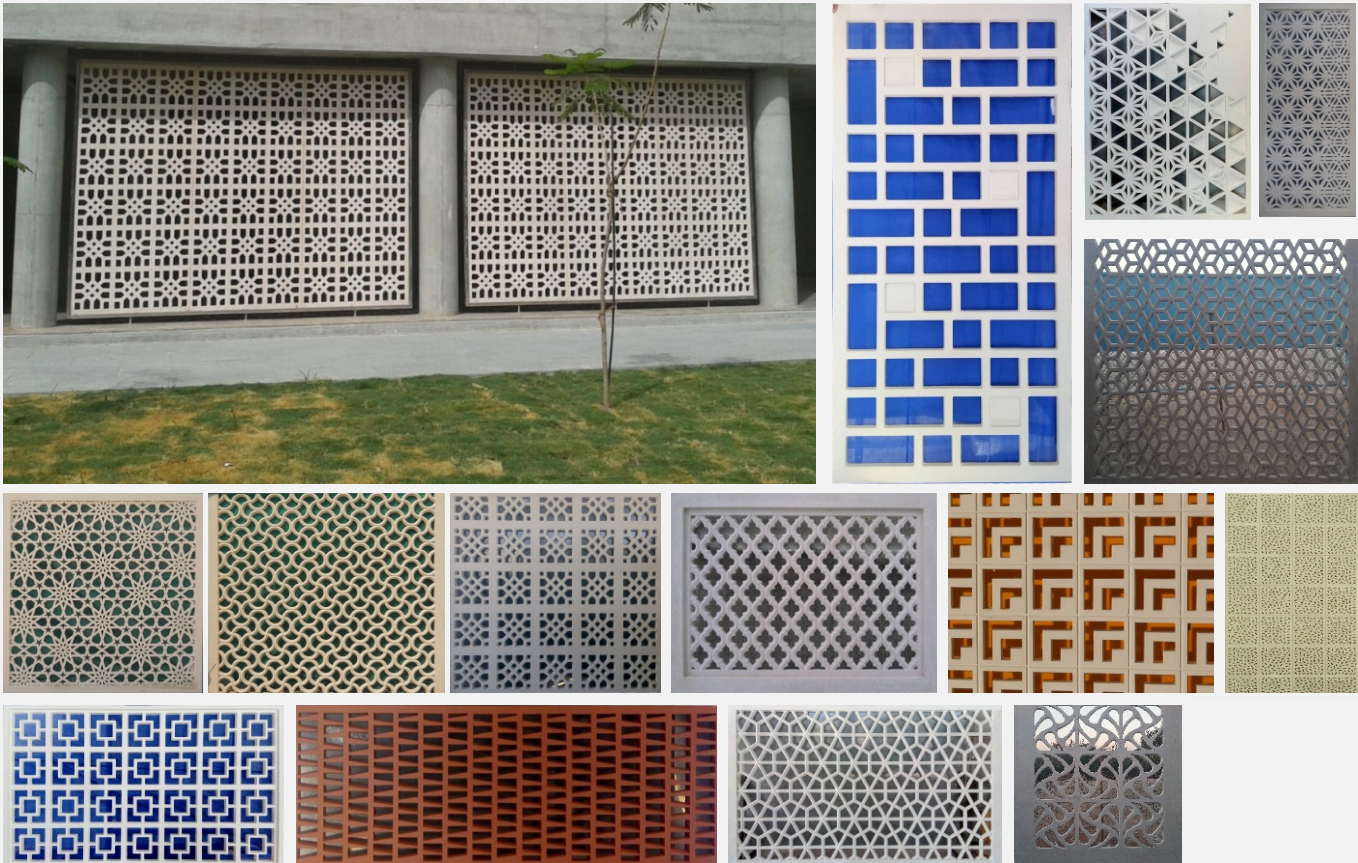
PLANTERS



DECORATIVE MORALS



GRC SCREEN



PRESTIGIOUS PROJECTS





MALL - SILIGURI



ARUL JYOTI MARRIAGE HALL-CHENNAI



ZAVERI & COMPANY-AHMEDABAD



SAVVY SPORTS ACADEMY - AHMEDABAD



ITC SONAR BANGLA HOTEL-KOLKATA



PRIVILON SAFAL - AHMEDABAD



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