

Formglas® GFRC-L

INSTALLATION INSTRUCTIONS

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Formglas® GFRC-L is a glass fiber reinforced concrete composite made with white Portland cement, silica sand, aggregates, color pigments and alkali resistant glass fibers. Formglas® GFRC-L has been fire tested to the ASTM E84 Standard and is classified as a Class 1 (or A) material with a Flame Spread Index = 0; Smoke Development Index = 0. These installation instructions are general in nature. Refer to the shop drawings for specific details.

STORAGE & HANDLING:

Delivery time should be scheduled to minimize the storage time of Formglas® GFRC-L parts at the job site. Parts shall be kept clean and stored on a dry surface and not stacked or leaned on each other to prevent distortion and other physical damage. Use gloves when handling unpacked items.

ITEMS FOR INSTALLATION:

Screw gun; Drill and assorted bits; Stainless steel screws; Level; Saw(s) - see Cutting Instructions below; Disposable dust masks (e.g. 3M Cupped respirators #8710) or a Respirator; Gloves; Sandpaper #80 and #120 grit; Painter's tape; Flexible scraper; 8-16 oz.(235-470ml) mixing container(s); Clean rags; Adhesive; Caulk for joints (supplied by others); GFRC-L color matching Patching Kit (supplied by Formglas).

CUTTING INSTRUCTIONS:

Cutting dust represents a nuisance dust when exposed to low concentrations from occasional cutting and grinding operations associated with the installation of Formglas® GFRC-L parts and may contain trace amounts of respirable silica. Take precautions to minimize dust production such as using dust collection attachments on saws etc. Wherever possible cut/grind/sand outdoors or in a well ventilated area. Always wear goggles, a respirator (or dust mask), and protective clothing to minimize any irritation from the dust.

Use the most applicable method listed below for the type of cut required:

- A miter or table saw with a Diamond blade for masonry use.
- A hand held disc grinder with a 4" (100mm) diameter Diamond blade for small cuts or cut-outs.

Method:

Dry Cut only. Perform a test cut(s) first to validate the saw and blades effectiveness. Keep cutting surfaces clean to prevent dirt, oils or other contaminants from being transferred onto the exposed surfaces of the GFRC-L parts.

GENERAL NOTES:

- 1) The substrates to accept GFRC-L parts and fabrications shall be surfaced with suitable materials (e.g. Plywood) and weather barrier as applicable. Substrate surfaces shall be installed level, straight and true within 1/8" in 8 linear ft. (3mm in 2500mm).
- 2) The substrate shall be free of obstructions and interference that prevents the correct positioning and attachment of the GFRC-L parts. Structural framing and substrate materials shall be of the proper size and design for the intended use and shall be sufficient to properly support the installed GFRC-L parts.
- 3) Refer to the shop drawings for specific details to install the GFRC-L parts and/or fabrications.
- 4) Part thicknesses may vary. Allow for shim spaces between the GFRC-L and the substrate.
- 5) Attach the GFRC-L parts using stainless steel screws or other fasteners as shown on the shop drawings. Additional bracing, or fastening points etc.

not shown on the shop drawings, may be required to ensure a proper installation.

- 6) Wherever possible, GFRC-L parts are to be installed with concealed fastening methods. Face fastening will always be visible and should be avoided.
- 7) Use joint spacers to maintain a uniform joint spacing as indicated on the shop drawings.
- 8) All GFRC-L joints must be caulked. Caulk to be supplied by others. Refer to page 6 for specific recommendations.
- 9) Do NOT attempt a monolithic look - joints can not be hidden.
- 10) Apply painter's tape on each side of the joint and avoid smearing caulk beyond the joint - remove any excess caulk immediately.
- 11) Formglas supplies a Patching Kit to match specific GFRC-L colors to patch screw holes or chips. Avoid smearing excess compound beyond the holes. Follow the instructions supplied with the patching kit.

WALL PANELS:

1. Formglas® GFRC-L parts and panels are installed with concealed fasteners wherever possible. Typically, this is accomplished by using attachment points located between the joint spaces between the GFRC-L parts which will later be filled with a joint sealant. For example, Fig.1 illustrates a simple wall panel arrangement where the attachment points are in the horizontal joint spaces between panels. The GFRC-L panels are supplied with factory attached, heavy gauge, stainless steel mounting brackets. In this example, the back surfaces of the wall panels have 2 upper and 2 lower mounting brackets attached to them that project 3/8" (10mm) beyond the top and bottom edges of the panels. The panel arrangement was pre-

designed to have a 3/8" (10 mm) joint spacing, which would be detailed on the Formglas shop drawings for a particular project. The panels are installed with screws that extend through the steel mounting brackets into support strapping secured to the substrate that forms an attachment grid. The Z-Bar grid system is typically used in exterior applications when anchoring into vertical support framing spacing the panels away from the substrate surface to provide an air and drainage space. For this reason, the grid system is installed with gaps between the horizontal lengths of Z-Bar. It is particularly important to install the first course of panels so that they are level and plumb and in proper alignment with one another. Always use joint spacers to maintain a uniform joint spacing.

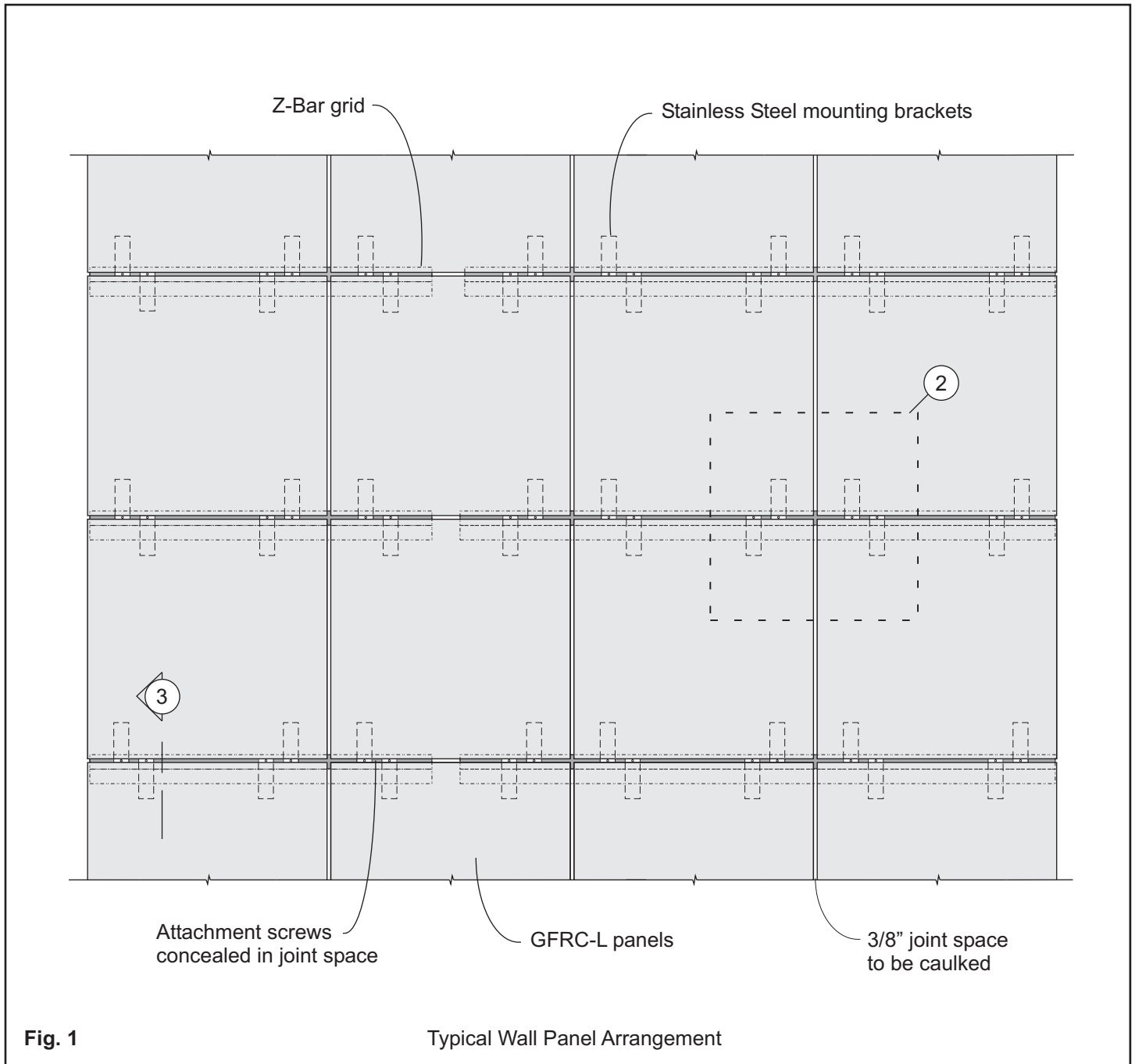


Fig. 1

Typical Wall Panel Arrangement

Fig. 2 below is an enlargement of the area marked with dashed lines in Fig. 1 that is identified as item (2). Fig. 2 illustrates an intersection of 4 panels. Note that the upper and lower panel mounting brackets are staggered so that the brackets attached to the upper panels are spaced horizontally apart from the brackets on the lower panels so there is no interference installing subsequent rows of panels.

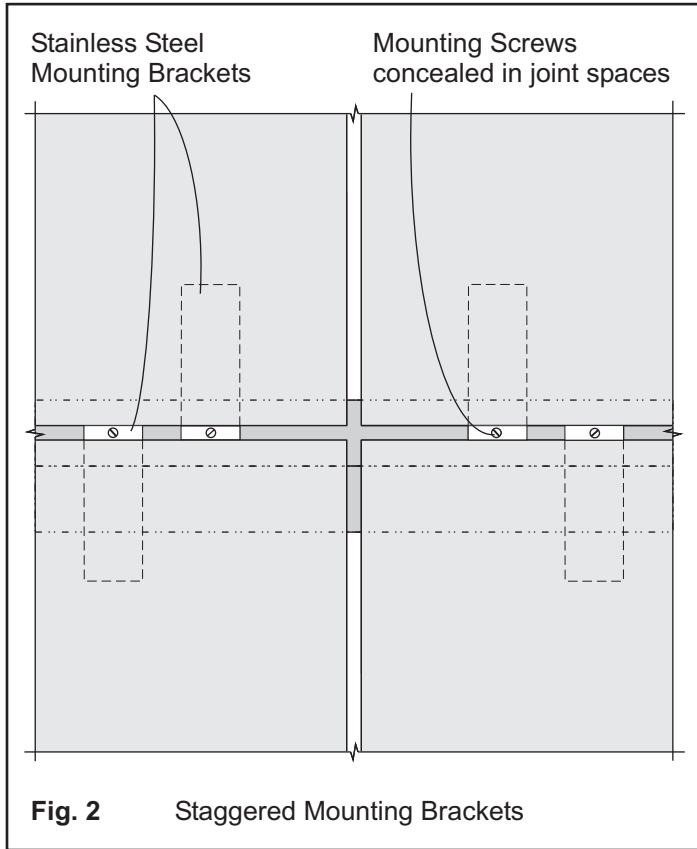


Fig. 3 below is a perspective view of the upper portion of one panel illustrating the panel attachment to a section of the Z-Bar grid.

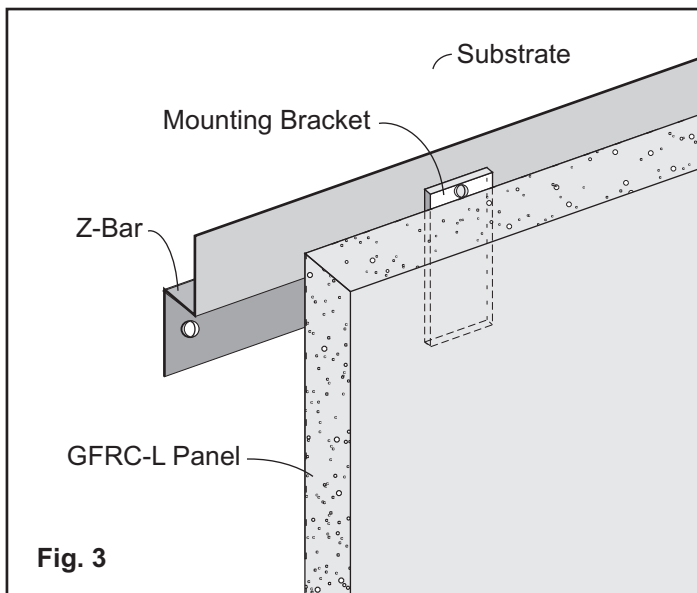
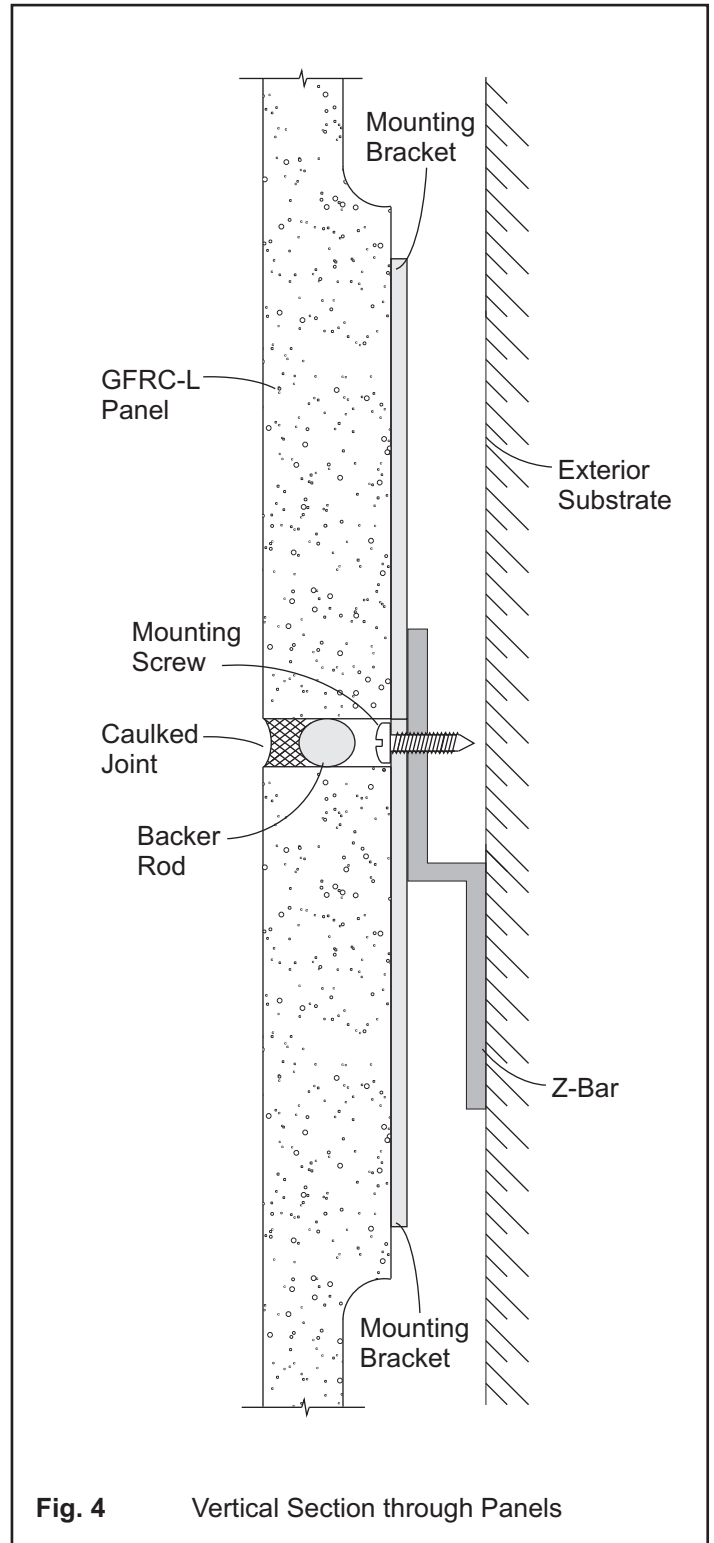
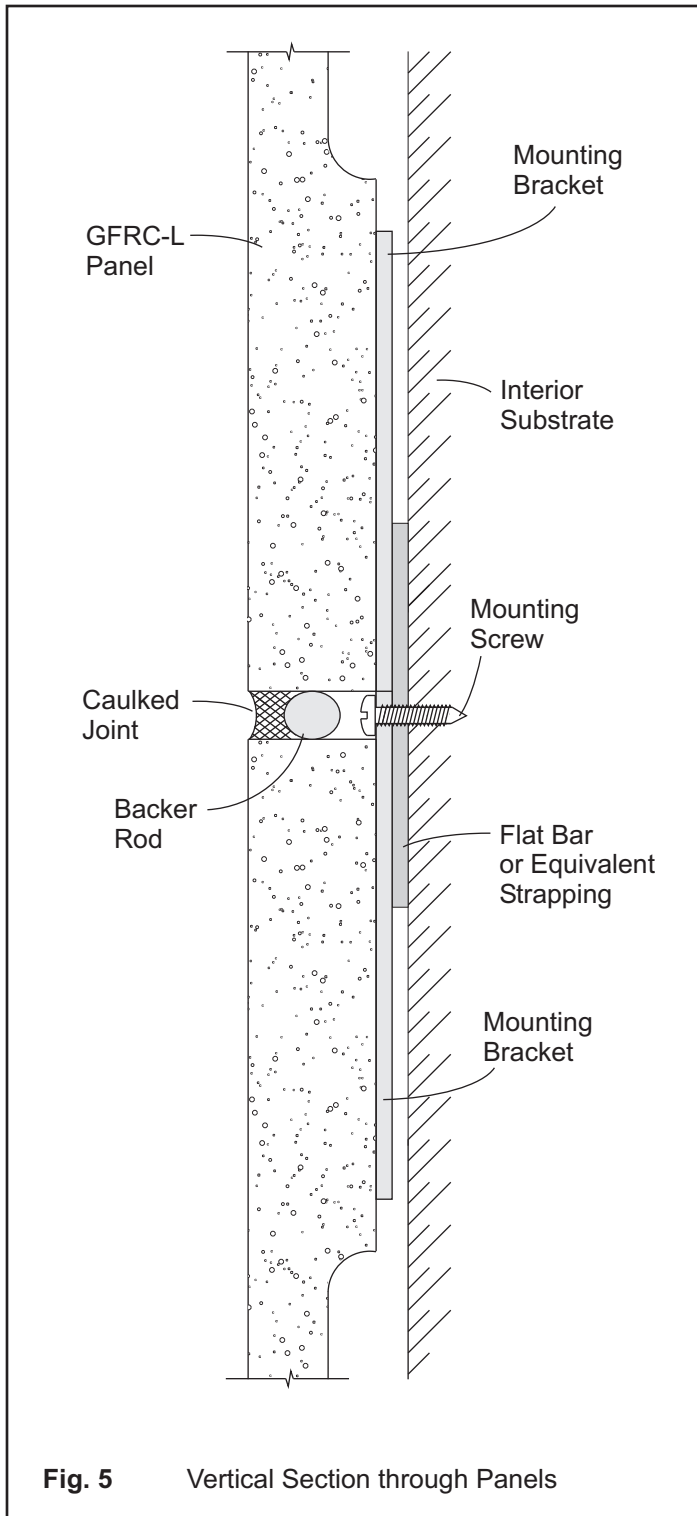


Fig. 4 is a vertical cross sectional detail of the panels indicated as item (3) of Fig. 1. This illustrates an upper and lower portion of the GFRc-L panels, mounting brackets, Z-Bar and substrate. Both the upper portion of the lower panel and the lower portion of the upper panel are secured to the same horizontal Z-Bar through the same joint space. After the installation is complete a flexible backer rod is placed into the joint space and the joint sealed with an appropriate caulk. See Joint Treatment on page 5 for more details.



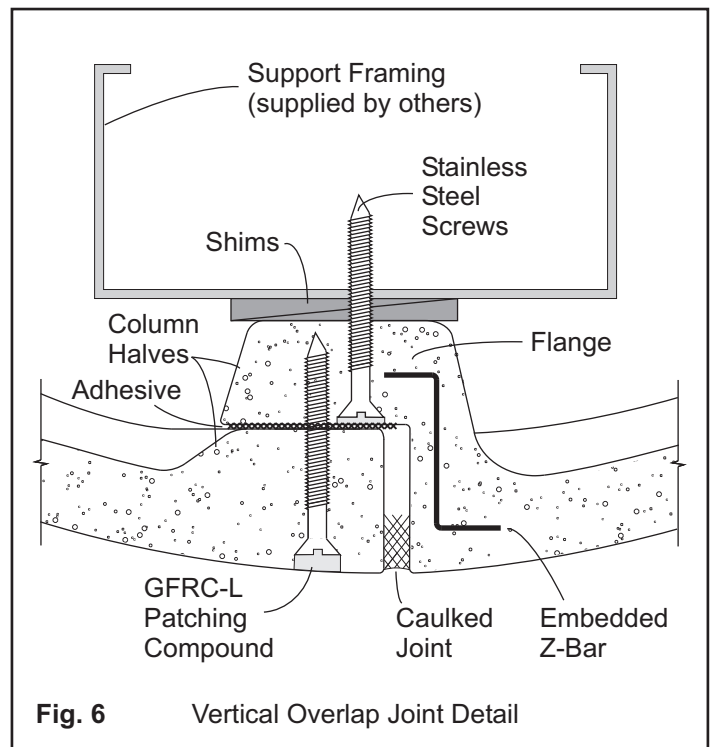
2. In applications where the GFRc-L panels are installed on interior walls, flat bars are used in place of the Z-bar (or an equivalent strapping material attached to the substrate). In most other respects the installation of the panels is similar. Refer to Fig. 5.



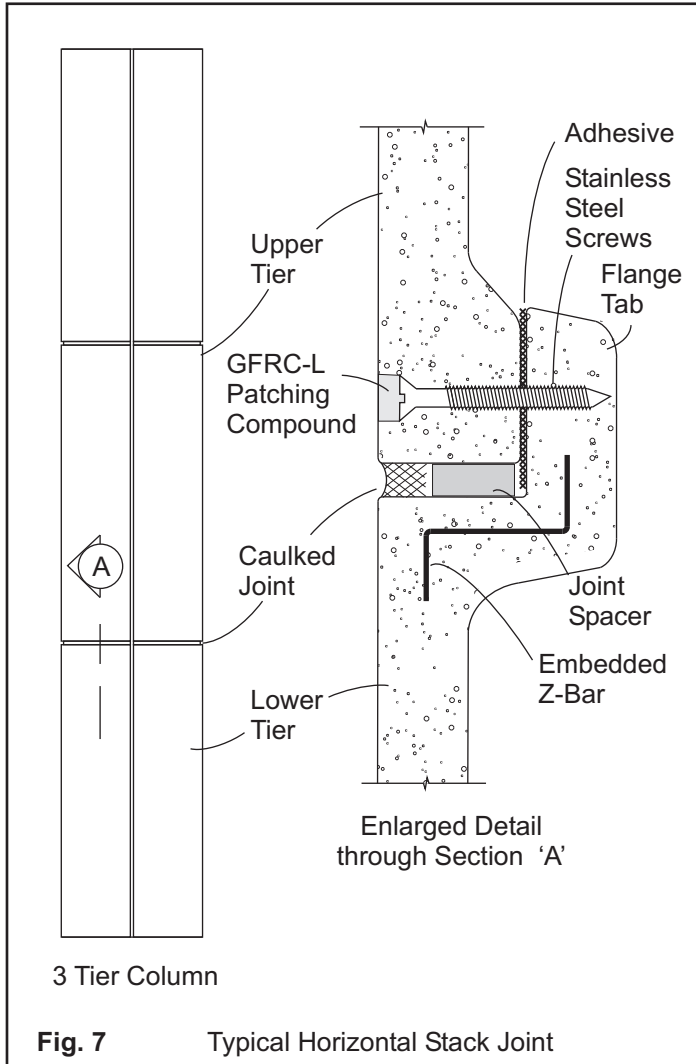
COLUMN COVERS:

1. GFRc-L column covers are supplied with an overlapping joint to secure both column halves to each other as illustrated in Fig. 6. In a typical arrangement, one of the column halves has both vertical edges

molded with an inwardly projecting flange that is used to secure that column section to the support framing (supplied by others). Shims are used between the framing and rear surface of the column to facilitate the secure attachment of the column section with screws without deforming the column curvature. Ensure that the screws are countersunk below the surface of the flange so they do not prevent the mating column section from fitting tight against the flange surface. This offset flange has an integral corrosion resistant Z-Bar embedded in the composite casting for added strength. The flanged column section is installed first. The mating column half section fits over the inwardly projecting flanges of the previously installed column section and positioned to leave a 3/16" joint spacing to be caulked. Prior to placing the mating column half into position, apply a bead of construction adhesive along the full length of the flanges. Use a Formglas recommended adhesive e.g. PL400 - see page 6 for details. Secure the column sections together with stainless steel screws installed through the face of one column section that extend into the overlapping flange of the other column section - see Fig. 6. Countersink the mounting screws and fill screw holes with matching GFRc-L patching compound supplied by Formglas. Note: Patched screw holes will be somewhat noticeable, so it is advisable to uniformly space holes apart. Apply painter's tape to both sides of each column joint and caulk with an appropriate color matching caulk. Formglas does not supply caulk but can recommend a brand name type and color for use with standard GFRc-L colors - see page 6. Plan in advance to get architect approval of the color matching caulk to be used on the project.



2. In some applications, the column height may require the use of one or more tiers of columns stacked one above the other. Refer to Fig. 7 for a cross-sectional view through the horizontal joint. In these instances, the top edges of the columns are molded with overlapping flange tabs to join the upper and lower sections together similar to the assembly method used to join two column halves together, but a flange tab is used and not a continuous flange.



MOLDINGS and OTHER COMPONENTS:

1. In most cases, moldings and other GFRC-L parts are installed with similar concealed fastening methods as detailed with wall panels and column covers which will be detailed in the Formglas shop drawings. In applications where face fastening is required refer to the shop drawings for details and the location of embedments for fastening purposes. Use a color matching patching compound supplied by Formglas and follow the instructions for Hole Filling and Patching. Note: patched holes will always be visible. Use face fastening only when required and position holes in the least conspicuous locations as possible and in a uniform arrangement.

2. Joint Treatment:

- Caulk all joints. Use backer rods as required.
- Formglas does not supply caulk for joints but can recommend a brand type and color of caulk for use with standard GFRC-L colors - see page 6.
- Use spacers (min 3/16") to maintain a uniform gap and apply painter's tape on each side of the joint.
- Avoid smearing caulk beyond the joint - remove any excess immediately with a damp cloth or flexible scraper.
- Caulk between GFRC-L and different materials.
- Do NOT attempt a monolithic look - joints can not be hidden.

3. Hole Filling and Patching:

- Follow the mixing instructions included with the patching kit materials.
- Patch screw holes (and/or required area) carefully without smearing the patching compound on the surrounding areas. Use painter's tape to mask areas as required.
- Let the applied patching compound dry for approximately 15 - 20 minutes then use a clean flexible scraper to remove excess material. Use a very lightly moistened, clean white cloth to remove any excess as needed. If an excessive amount of compound was applied or dropped on the surface, remove immediately.
- Let patched area cure overnight. If shrinkage occurs, re-patch as needed.
- Lightly sand patched area with #80 grit sandpaper for the GFRC-L sandblasted texture and #120 grit sandpaper for the GFRC-L (QuarryCast) texture.

Always use patching compound sparingly

Avoid smearing it beyond the holes

Always remove excess compound immediately

CLEANING and MAINTENANCE:

- Clean soiled GFRC-L surfaces with water, using clean, soft fiber brushes and/or sponges. If initial cleaning with water is not sufficient to remove the soiled area, use a mild soap with water and clean soft fiber brushes and/or sponges.
- A power washer could be used to clean large or hard to reach soiled areas, but it should be tested first on a small, inconspicuous area and allowed to dry completely. To prevent damage to the surface (texture), adjust the power washer pressure accordingly. It is suggested that power washing is done during warm and dry weather so that the parts can dry quickly and completely.
- Always take precautions to prevent staining of adjacent materials when cleaning.

FINISHING MATERIALS

Formglas® GFRC-L Patching Kit (XGRT)

Patching Kit includes: 1 container of material powder and 1 container of liquid additive. Each container is pre-weighed for the correct mixing ratio.

Caulk: (Not supplied by Formglas) Brand name caulk for use with Formglas® GFRC-L standard colors. Caulk is not an exact match. It is recommended to get architect approval of caulk prior to use.

GFRC-L Color	Caulk Brand	Caulk Color
SEATTLE SAND:	Dow Corning 790	" Precast White "
	Dow Corning CWS	" Off White " (available in the 20 oz. sausages)
BOISE BUFF:	Dow Corning 790	" Sandstone "
	Dow Corning CWS	" Sandstone " (available in the 20 oz. sausages)
DESERT SAND:	Dow Corning 790	" Limestone "
	Dow Corning CWS	" Limestone " (available in the 20 oz. sausages)
TAN:	Dow Corning 790	" Sandstone "
	Dow Corning CWS	" Sandstone " (available in the 20 oz. sausages)

Recommended Adhesives:

PL 400, PL 400voc, PL Premium - Manufactured by the Henkel Corporation - sold under Loctite and Lepage Brand names.

Note: PL400voc & PL Premium have 50 g/l VOC's or less for use at Green Building projects such as LEED® where low emitting materials are required.