GigaCrete

# GENERAL INSTALLATION GUIDE

GigaCrete

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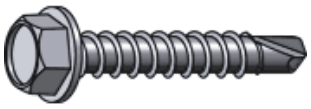
GigaCrete

# Required Materials

*Refer to Pictures*

## Hardware

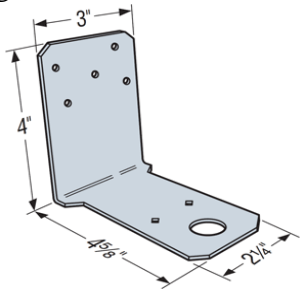
1. IBC/ICC-ES code approved self-drilling, self-tapping #10 hex head Tec Screws



2. 5/8" or ¾" galvanized #11 matching structural grade washers and course #11 thread hex nut

3. 5/8" to ¾" course thread expansion anchors.

4. Truss angle brackets minimum 1/8 (3mm) thickness




5. #11 galvanized or zinc coated coupling nuts.

# Required Materials

*Refer to Pictures*

6. #11 hot dipped galvanized all-thread in 10ft lengths

7. 1 ¾” to 2” galvanized steel washers

8. 3-inch coated screws

9. Water resistant 3.5”x 50ft Dow Sill Seal foam Gasket.


# Required Materials

*Refer to Pictures*

10. Spray PU foam and application gun supplied in boxes by GigaCrete

## Patented Connector Components

1. ICBO approved (ICC-ES) 18 GA galvanized Steel Roof Studs and top and bottom track

2. Steel Studs (Three Types of Studs)
    a. Single

b. Double


# Required Materials

*Refer to Pictures*

3. EPS Foam Type I, ASTM C303, ICC-ES Report ESR-1566
   Comes in 3 different Shapes



Insulated Panels come pre-marked with reference codes

"P" Flat Panels
"SP" shear panel
"WH" window header panel
"WS" window sill panel.
"DH" door header panel.

"C" Corner Panels

"T" Intersecting Panels

# Required Materials

*Refer to Pictures*

"R": Roof Panels (consists of two pieces)

"SP" : Shear Panels

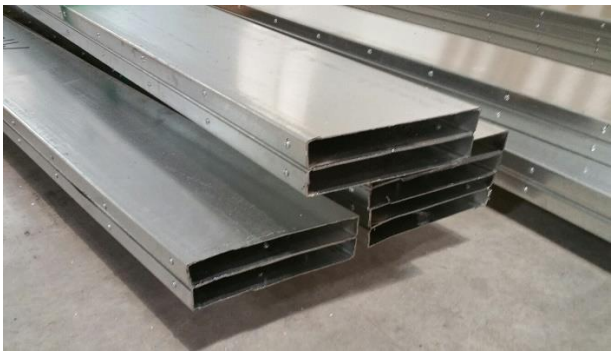
“D” Door Panels (pre-assembled) “W” Window Panels (pre-assembled)


# Required Materials

*Refer to Pictures*

“G” Gable Panels are pre-made by GigaCrete. No Images

4. Roof Trusses & Hurricane Hardware:
Custom made and engineered to specific sizes depending on span and loads.



2”x12” boxed section truss/joist

cut with “birds mouth” ends to overhang exterior walls.

## Required Materials

*Refer to Pictures*

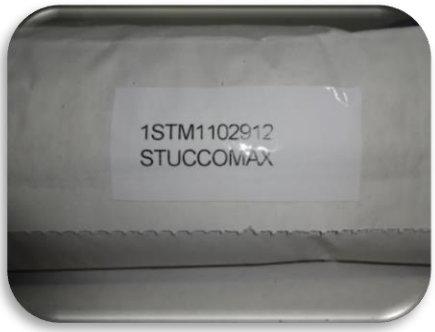
5. Truss Connector/all-thread anchors connecting truss into foundation
6. 
7. Angle bracket (gauge determined by engineering) connects truss to anchors

8. Sprayed PU foam which locks plumbing into place within the foam panel but must be signed off by local structural engineer as code compliant or approved.

9. Roofing varies on each project. Typical applications are standing seam metal roofing, conventional tile, Bermuda GigaRoof seen below.

10. Window Trim (Outdoor)

11. StuccoMax exterior weather resistant, PlasterMax interior fire rated abuse resistant

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# CHECKLIST

| Item | Qty | Yes | No |
|---|---|---|---|
| #10 Self tapping hex head Tec Screws | | | |
| #11 Matching structural grade washers, course #11 thread hex nut | | | |
| 5/8" to ¾" course thread epoxy anchors 4.5" minimum | | | |
| #11 Course thread Galvanized or zinc coated coupling nuts | | | |
| #11 Course thread Hot dipped galvanized all-thread in 10ft lengths | | | |
| Water resistant 3.5"x 50ft Dow Sill Seal PP foam Gasket Rolls. | | | |
| Spray low expansion PU foam in cans with application gun | | | |
| Steel Stud: Single "C" Section 18-gauge galvanized steel | | | |
| Steel Stud: Double Inline Connectors | | | |
| Steel Stud: L for 90-degree Corners | | | |
| Steel Track: Bottom "U" section 18 gauge galvanized | | | |
| Steel Track: Top "U" section 18 gauge galvanized | | | |
| EPS Foam: Flat 1.0 lb. density or higher EPS foam | | | |
| EPS Foam: Curved "C" 1.0 lb. density or higher EPS foam | | | |
| EPS Foam: Corner "C" 1.0 lb. density or higher EPS foam | | | |
| EPS Foam: Intersecting "T" 1.0 lb. density or higher EPS foam | | | |
| EPS Foam: Roof Panel 1.0 lb. density or higher EPS foam | | | |
| EPS Foam: Shear Panel 1.0 lb. density or higher EPS foam | | | |
| EPS Foam: Door Header Panels | | | |
| EPS Foam: Window Header Panels | | | |
| EPS Foam: Window Sill Panels | | | |
| Roof Trusses Steel | | | |
| Window Trim | | | |
| Ceiling Studs and track | | | |
| Angle Brackets Top Track to Roof Truss or Floor Joists | | | |
| Shear Panel Strapping steel strips | | | |
| Roofing | | | |
| PlasterMax and B2 Activator Crystals | | | |
| StuccoMax | | | |
| Gable Panel | | | |
| Roof Studs | | | |
| Truss Connector Brackets to all-thread anchors | | | |
| 1 ¾" to 2" plastic washers | | | |
| 3" screws | | | |

GigaCrete

# Assembly Instructions

## Phase 1: Track Layout

Step 1: Acquire necessary materials

- Steel bottom and top tracks
- Water Resistant 3.5" by 50' Dow Sill Seal Foam Gasket
- Course Thread Expansion Anchors (measurements will depend on wall panel heights)

Step 2: Acquire necessary tools

- Ramset Gun
- Tape Measure
- Wrench/Socket Driver
- Drill
- Hammer
- Metal Sheers
- Small Pry Bar

### *Verify concrete slab is cured sufficiently and flat, NO inset anchor bolts*

Step 3: Lay Steel Track down onto your concrete slab ensuring the track is square and perfectly aligned and matches exactly the installation "bottom track layout" drawings from GigaCrete.

Step 4: Sill Foam Gasket is placed directly underneath the steel track outlining the entire outer edge of the home. This is to stop moisture or insects from entering anywhere where the slab may not be totally level. The gasket compresses as the house gets built.

# Assembly Instructions

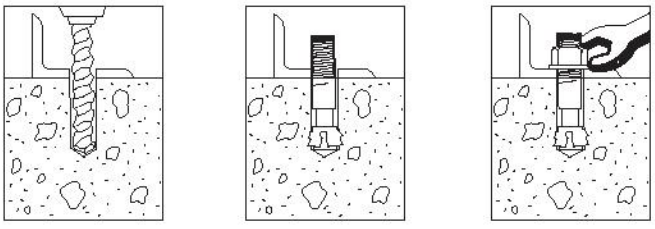
Step 5: Set steel track in place using Ramset Gun by placing nails into steel track every 2 feet. Once again ensure track is square and aligned.

**Track may need to be cut so corners can intersect.**

Step 6: Using your Drill, set expansion anchors through Steel Track into the concrete slab. Set expansion anchors in location as specified by blueprints.

How to set Expansion Anchors

1. Drill through steel track into concrete slab. (For 5/8-inch minimum drill depth is 2 ¾ inches)
2. Place Expansion Anchor in hole.
3. Using a Hammer, push expansion anchor down.
4. Using Wrench/Socket Driver, tighten down expansion anchors.



Step 7: Make sure Steel Tracks are secured firmly to the concrete slab. Attach extra fasteners/anchors if necessary.

## Phase 2: Install Panels

Step 1: Acquire Necessary Materials

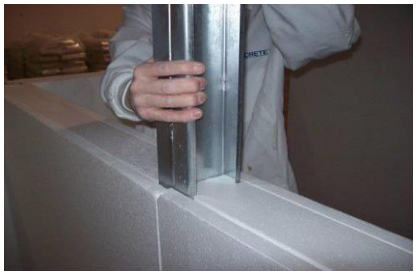
- Labeled EPS Foam Panels (including door and window)
- Labeled EPS Foam Panel T, Corner and Straight
- #10 Self tapping hex head Tec Screws
- Steel Track Top
- Steel Studs
- #11 hot dipped galvanized all-thread in 10ft lengths
- #11 galvanized or zinc coated coupling nuts
- Shear Panel Strapping

Step 2: Acquire Necessary Tools

- Drill
- 5/16$^{th}$ inch driving head (for screws)

***Wear hand protection when handling steel studs***

Step 3: Starting in corner, place labeled EPS Foam Panels along the bottom track. As each panel is placed, set stud in slots between foam panels connecting each together. Install single studs required locations.



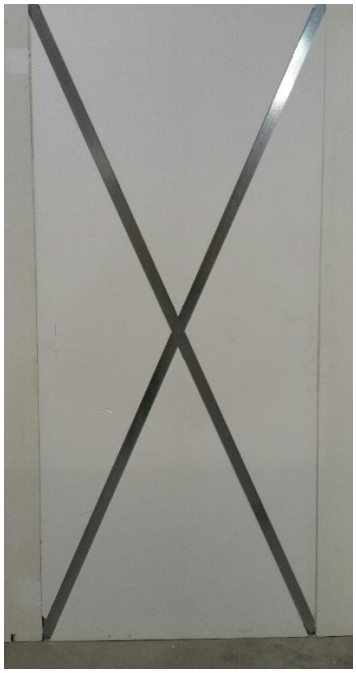
Step 4: When you have come to a location where tie down is required; place all thread through hole in panel. Support panel with a 2x4 or blocking to allow access and secure all thread to course thread expansion anchor using coupling nut. Tighten using two wrenches that lock the coupling nut to the anchor bolt nut. Repeat for necessary locations.

Step 5: Insert Door and Window Header Panels as shown on blue prints.


# Assembly Instructions

Step 6: Place Steel Top Track on top of all wall panels and use #10 hex head self -tapping screws to attach tracks to studs, screwing straight through the eps foam which later gets coated over.

Step 7: Attach shear panel strapping to shear panels using #10 hex head self -tapping screws.



Step 8: Using your Drill and screws; attach each stud to top and bottom track using #10 Self tapping hex head Tec Screws. Ensure this is completed on inside and outside of walls.

Step 9: FOR GABLES

Using Drill and screws, attach another track on top of the top track making a back to back track. This step will be completed only on the wall panels where gables are located. The pre-made gable now drops into this track.


## Phase 3: Bracing the Walls Vertically and Levelled.

Step 1: Acquire necessary tools.

- Bracing Material (studs can be used)

Step 2: Brace, square and level each wall.

Step 3: Temporarily secure walls in place using bracing until trusses are installed

# Assembly Instructions

## Phase 4: Installing the Trusses

Step 1: Acquire necessary materials

- Trusses
- Truss Connector/Stabilizer
- Angle Bracket
- #10 Self tapping hex head Tec Screws
- EPS Foam Gabel Panel

Step 2: Acquire necessary tools

- Electric Drill
- Ladder

Step 3: Place EPS Foam Gable Panel in locations specified by blueprints. Trusses will be above these panels.

Step 4: Slide studs into Gabel Panel and put steel top track on top.

Step 5: Screw together firmly (refer to Phase 2 Step 9).

Step 4: Carefully place truss into desired locations as specified by blueprints.

Step 5: Using drill and #10 Self tapping hex head Tec Screws, secure truss to the top steel track using the angle bracket.

Step 6: Repeat steps 3 through 5 for additional trusses as needed.

Step 7: Place Truss Stabilizer on truss pairs opposite one another. Secure using drill and #10 Self tapping hex head Tec Screws.

# Assembly Instructions

## Phase 5: Roofing

Step 1: Acquire necessary material.

- Roof Studs
- EPS Foam Roof Panels
- #10 Self tapping hex head Tec Screws
- Angle Bracket
- Roofing (outer roof) M4 boards or others supplied by GigaCrete

Step 2: Acquire necessary tools.

- Drill
- Ladder

Step 3: Place roof panels in locations designated by blue prints.

Step 4: Slide studs into precut slots in each panel.

Step 5: Using drill, Tec screws and angle brackets, secure studs to trusses at intersection points.

Step 6: Install outer roof material onto roof as specified by blue prints.

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# Assembly Instructions

## Phase 6: Ceiling

Step 1: Acquire necessary materials

- Hard Cap Ceiling Studs (ceiling stud)
- #10 Self tapping hex head Tec Screws
- Angle Bracket
- Gypsum Board or alternate

Step 2: Acquire necessary tools

- Ladder
- Drill

Step 3: Process for installing ceiling differs according to location within the house

For Installing Ceiling from outside wall:

1. Using drill and Tec Screws, secure ceiling stud inside home on the outer wall. The bottom of the stud must be level with opposite inside wall. The wall the stud is secured on should be opposite of inside walls. Flat face of stud should be against wall while open side should be facing inward. Ensure stud spans entire length of one wall.
2. Lay ceiling studs on foam walls within the house.
3. Slide each stud to the stud secured to wall in #1.
4. Studs should now span from the stud secured to the wall in #1 to the inner walls. Distance between studs should be equal.
5. Using Angle Bracket, secure ceiling studs to the inner walls.
6. Screw ceiling studs into stud secured to wall in #1.

For Installing Ceilings from Rooms within Home

1. Lay ceiling studs down on top of each side of wall.
2. Space studs evenly across top of walls.

a. Individual studs can be used for more than one room provided length and ceiling height are compatible.

b. Using angle brackets, secure ceiling studs to the top of each wall

Step 4: Attach 2" of EPS foam to the underside of ceiling with 3" screws and plastic washers.

# Phase 7: Foam Trim

Step 1: Acquire necessary materials.

- EPS Foam Trim
- #10 Self tapping hex head Tec Screws
- Spray PU foam

Step 2: Acquire necessary tools.

- Durabond
- Rasping Tool

Step 3: Attach EPS Foam Trim in desired areas using Durabond.

Step 4: Fill in any holes or voids with Spray PU foam.

Step 5: Prepare walls for coating by rasping walls flat. Also sweep up waste and foam beads before proceeding.

# Assembly Instructions

## Phase 8: Rough Electrical and Plumbing

Step 1: Acquire Materials (Gigacrete does not provide material)

- Designated electrical supplies
- Designated plumbing supplies

Step 2: Acquire necessary tools

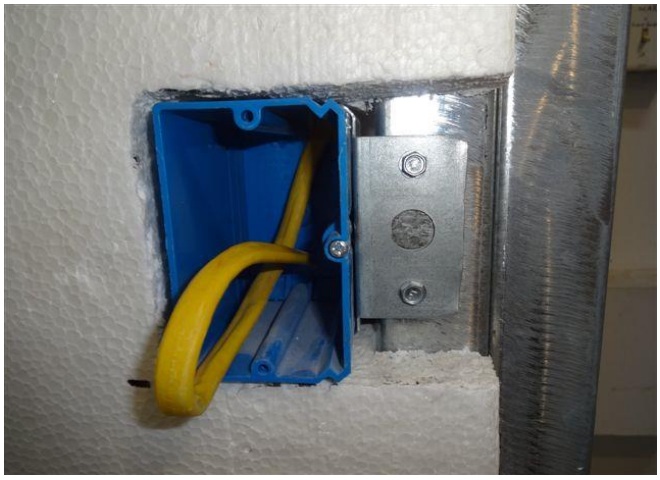
- Tools provided by installers of electrical and plumbing.



### Electrical

Step 3: Locate where electrical outlets and switches will be placed as per specifications/design, make sure they align with vertical chase holes cut into foam next to each steel stud. All boxes can only be located next to studs.

Step 4: Using hot-knife tool, cut out foam to allow insertion of electrical boxes and double check the vertical chase hole matches punch-outs in electrical boxes. Secure with screws to steel studs as shown below to meet codes.



Step 5: All wiring is run across tops of walls through floor joists or ceilings. Cut hole in top track and insert code compliant plastic grommet where wiring is needed to drop vertically down into pre-cut panel chases located on both sides of each vertical stud. This is the only place wires are pulled through any metal and is easily visible for inspections.

Step 6: Feed romex wires (residential) or conduits (commercial) from electrical source through top track grommet and down to outlets and switches using vertical electrical chases that are cut into foam panels.

Step 7: Fill voids around electrical boxes with supplied Spray PU foam. Rasp excessive foam flat and parallel to wall surface in preparation of coatings.

Step 8: Where wires are pulled through conduits in foam, the wiring or flex must be secured at 48" centers. This is done with fast setting PU spray foam which is inserted into the vertical chase by pushing the nozzle of the spray foam through the EPS foam every 48" penetrating the nozzle about 1.5" into the conduit void and releasing a shot of foam for about 2 seconds. The expanding foam will lock the wiring in place within the chase and will seal off the hole created by the foam gun nozzle.

**Plumbing**

Step 1: Locate where plumbing lines and vents will be placed as per specifications and design. Make sure they are not where vertical steel studs are already located, lines should be between each steel stud as code requires lines and vents must be securely attached to studs.

Step 2: Using hot-knife tool, cut out foam to allow insertion of all plumbing lines and vents. Secure strapping with screws to steel studs as shown below to meet codes.

Step 3: If copper tubing is used, protect the EPS foam from the heat which will melt the foam creating holes in the wall panels. This can be done with simple shielding using a piece of gypsum board or plywood, but be careful not to cause a fire.

Step 4: Once all lines are permanently located, there are two options to affix lines in place. #1, Spray PU foam into the voids where lines are placed and fill the voids with expanding foam. Trim flush once foam is fully cured and have a structural engineer sign off that this is adequate to meet local codes. #2. Using plumbing strapping, tie back to studs and then foam in place as per #1. Hot water will stay hotter and cold, colder. This will also help avoid freezing of plumbing lines in extremely cold weather. After the foam has cured, cut off excess with a simple hand saw ready for GigaCrete coatings to be installed.

# Assembly Instructions

## Phase 9: Coatings

***Direct Application to EPS***

***Preparation***

Rasping is necessary to remove potential bond breakers and to ensure good adhesion. Survey the substrate for irregularities that may adversely affect the application such as minor protrusions and voids.

Mechanical chase voids cut into the EPS need to be filled prior to the **PlasterMax™** or **StuccoMax™** installation. Low expansion spray foam is applied into the void, allowed to cure and shaved flat with the surface. Wind-Lock's Foam2Foam is recommended for this purpose.

***Fiberglass Mesh***

11-ounce fiberglass mesh supplied by GigaCrete is typically used and is a critical part of the **PlasterMax™** or **StuccoMax™** application. A rough 1/8" coat of **PlasterMax™** or **StuccoMax™** is applied to the EPS and worked reasonably flat. Precut the mesh which is hung vertically like wallpaper and with a trowel, press in the mesh imbedding the mesh into the first coat, working the coating material through the open weaves in the mesh while ensuring that the mesh is flat and free of wrinkles. Ensure all open gaps in the mesh are filled with the coatings material prior to applying the second coat. Overlap adjoining mesh by a minimum of 2.5". A second coat of **PlasterMax™** or **StuccoMax™** is immediately applied over the mesh to the specified thickness. If additional working time is required in hot weather, use the retarder supplied by GigaCrete.

***Spraying***

**PlasterMax™** or **StuccoMax™** may be applied by hawk and trowel but spray application is recommended for best results on larger walls. Spray in a fashion that allows the trowel person to stay in close proximity to the sprayer and allows a continuous wet edge. Working wall areas in sections from top to bottom works best.

***Hawk & Trowel***

**PlasterMax™** or **StuccoMax™** is hand applied like most conventional plaster material using the same tools, (see photos below)

***Tools Needed***

***Trowel Timing*** Dry and set times depend on material viscosity, temperature and humidity. Generally, the first trowel pass is approximately 20 minutes after the initial application and in 20-minute intervals for subsequent trowel passes. Troweling from top to bottom each time helps to keep a good wall profile.

# Finishes and Textures

***Smooth*** Obtaining a smooth finish is easy when good installation practices are adhered to. **PlasterMax™** has good trowel ability but differs from conventional plasters where no surface water is used to aid the trowel pass. Additionally, over troweling at any one time may result in material drag and surface blistering. A dense, smooth finish for paint specified walls may be realized in few trowel passes-at times only one pass is necessary.

***Decorative*** When **PlasterMax™** is specified as the wall finish (exposed not painted) then additional trowel passes are necessary beyond the acceptably smooth stage. Make passes from top to bottom at 15-20-minute intervals using the usual trowel pressure until the surface begins to mottle and shine. Extra pressure is not necessary as the material will begin to polish regardless. Surface blackening becomes more pronounced with each additional pass. Subtle mottling is generally more desirable so use caution not to over trowel.

***Texture*** Spray textures such as orange peel, splatter and splatter knockdown are also possible. Texturing is performed during the second coat application. Stamp texturing is easily achieved with a 9" urethane

texture roller. Liquid or "bubble gum" release agent is lightly sprayed on the coatings surface and on the roller. A wide variety of textures are possible with this method.

***Trim*** Vinyl edge trim, expansion joints and door and window edge molds are required to separate dissimilar materials from touching the coatings. This is done to avoid cracking from thermal expansion and contraction of dissimilar materials and potential corrosion reactions between PlasterMax and metals.

There are numerous manufacturers of vinyl components, here are two preferred:
www.plasticomponents.com www.vinylcorp.com

***EPS (Expanded Polystyrene) Foam Specifications***

StarRfoam VIII is a lightweight, closed cell, rigid insulation, manufactured from expanded polystyrene (EPS). StarRfoam EPS meets or exceeds ASTM C578, Type VIII, Standard specifications for rigid, cellular Polystyrene Thermal Insulation.

***Strength Properties***
ASTM D1621 Compressive Strength @10% deformation on, min. 13-18
ASTM C203 Flexural Strength (min. psi) 30.0
ASTM D2126 Dimensional Stability 2.00%
ASTM E84Flame Spread <20
ASTM E84 Smoke Developed 150-300
ICC-ES Evaluation Report ESR 1556

***Physical and Thermal Properties***

ASTM C303 Nominal Density (pcf)
ASTM C518 or C177 Thermal Resistance R-Value
(per inch) at 25F. 4.55
(per inch) at 40F. 4.25
(per inch) at 75F. 3.92

ASTM E96 Water Vapor Permeability 3.5
ASTM C272 Water Absorption (max % volume) 3.0
ASTM D2863 Oxygen Index, Min 24%