

GIGAHOUSE™

Description

High speed assembly of components designed to create super-insulated, pre-engineered steel framed structures utilizing IBC/ICC-ES code approved products and materials. Components consist of galvanized 18ga “C” section steel studs and “U” shaped track, and thick EPS foam sheets utilizing minimum 1.0 lb density foam. 6” to 12” thickness EPS insulation sheets are CNC cut with electrical chases and channels to accept structural steel studs and patented stud connectors. Panels are used for walls and roofs and erect rapidly, dramatically reducing labor costs. All panels are guaranteed square and accurate and are machine made. Framing conforms to typical IBC steel framing

Components

EPS Foam

Insulation panels are cut into 3 typical shapes of varying heights and widths, walls are typically 6” to 12” thick and maximum 48” wide and up to 10 ft in overall length. Channels are pre cut at the factory to accept steel studs and patented stud connectors. The purpose of the pre-cut insulation panels is two-fold: Provide superior insulation, reduce thermal bridging and create a means of rapidly installing structural steel studs by eliminating measuring and utilizing unskilled or semi skilled labor in the field.



Steel Studs/track

IBC/ICC-ES code approved “C” section cold-rolled galvanized steel studs with top and bottom track, 18 gauge typical, conform to standard steel framing principals where steel studs are mechanically connected via self drilling self tapping Tapcon screws. Patented panel to panel connectors are formed from 2 steel studs connected to form a slide in extrusion locking each insulation panel to the next. A panel to panel connector acts as a 4x4 stud at every connection. Intermediate 2x4 studs are at 16” or 24” on center between two 4x4 connectors. Tapcon screws connect all studs top and bottom to steel track with two screws one on each side top and bottom. (Through the EPS foam which is later covered with PlasterMax and StuccoMax)



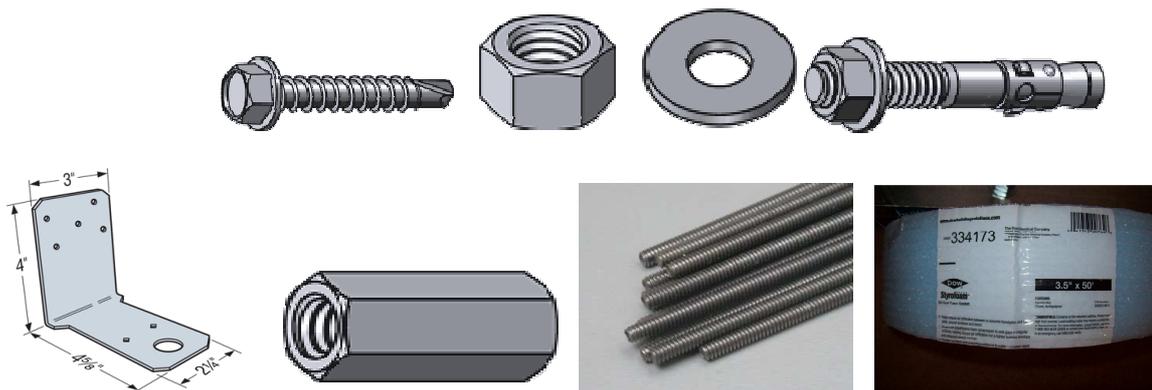
Tie-down anchors

IBC/ICC-ES code approved means of connecting foundation anchors to roof or floor trusses through a continuous engineered steel connection from slab to roof. Components consist of expansion or epoxy anchors drilled into cured concrete slab. #11 coarse thread coupling nuts connect 5/8" or 3/4" all-thread to anchors. Rods pass vertically through pre-cut holes in EPS insulation panels, through HD brackets with structural grade washers and nuts and attach to the roof truss with Tapcon screws. Note: washer and #11 coarse thread structural grade hex nut can be torqued down creating a solid steel connection from roof to slab.



Accessories

IBC/ICC-ES code approved self drilling, self tapping hex head Tec Screws, 5/8" or 3/4" galvanized #11 matching structural grade washers and course #11 thread hex nuts. 5/8" to 3/4" coarse thread expansion anchors. Truss angle brackets, #11 coupling nuts and #11 hot dipped galvanized all-thread in 10ft lengths. Water resistant 3.5"x 50ft Dow Sill Seal foam Gasket.



Jobsite Considerations

Concrete Slab Concrete slabs must be flat and cured before bottom tracks are shot into or bolted to the concrete. Moisture barriers such as Dow Styrofoam Sill Seal foam gasket must be used at all times under bottom tracks to stop water ingress.

Wind Lightweight EPS panels should not be installed during high wind conditions unless adequate wind blocking or shielding is provided. Bracing is recommended whilst panels are being erected. If possible, plan the building envelope stage to be assembled during low wind conditions.

Direct Sunlight Shade the **GigaHouse™** from direct sunlight during the installation of exterior coatings and their initial 48 hour cure.

Air Movement Air movement can assist in maintaining good drying conditions in high humidity environments. Avoid direct air movement across the **GigaHouse™** surface during StuccoMax installation as it may prematurely dry the surface and promote surface cracking.

Moisture The assembly of **GigaHouse™** panels and steel studs are unaffected by moisture. However, the coatings of PlasterMax and StuccoMax stage require their Best Practices be followed.

PANEL TYPES AND COMPONENTS

Insulated panels come pre-marked with reference codes as follows:

- **EPS foam panels** (A) Flat panels. (B) Curved Panels. (C) Corner panels. (T) "T" intersecting panels. (R) Roof panels. (S) Shear panels. (D) Door panels.
- **1lb and 2lb density** (W) Window panels.

- **Thickness range from 4.5" to 12"**

- **Widths up to 48"**

- **Heights to 10'**



Pre-Assembled panels

Doors and window panels are pre engineered and factory assembled ready for final doors and windows to be installed onsite. These panels are marked: (D) Door panels. (W) Window panels (S) Shear panels (R) Roof panels

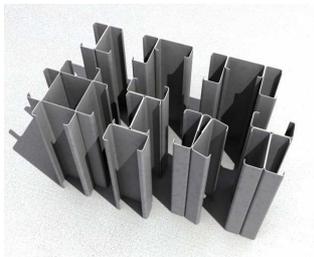
Roof panels

Roof panels consist of two pieces. The main panel has the connectors and purlin studs cut into the foam at 16" on center spacing for onsite installation of steel components. The studs are exposed on the inside and after installation are covered with an additional second EPS foam layer to maintain maximum thermal blocking.



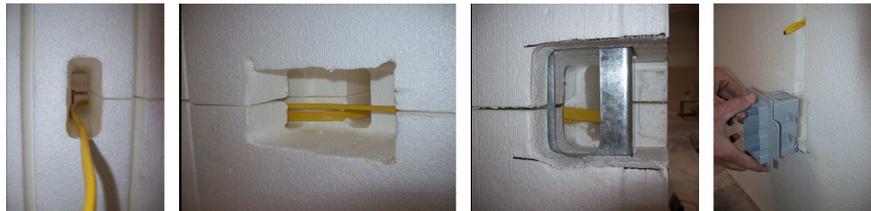
Steel Studs & Connectors

IBC & ICC-ES code approved Steel Studs and Patented Connectors made from Galvanized "C" section cold roll formed steel are used as the structural components within the insulation panels. They are dropped vertically into channels cut into the EPS panels and connect top and bottom to galvanized steel tracks typical to steel framed construction. The pre engineered EPS insulation foam acts as the slots for the studs to slide easily into the panels. This guarantees accurate placement each time and eliminates measuring reducing skilled labor time and costs and rapidly speeding up the installation process. 20 feet of walls can be erected in five minutes with a 3 man crew.



Electrical Wiring

Conventional romex wiring used in typical steel stud construction is also utilized in GigaHouse. Three horizontal electrical chases are pre cut into the foam insulation panels and align with the standard steel stud punch-outs for wall outlets, light switches or wall sconce locations. Conventional “wire pullers” are used to easily navigate wiring through the panels. Access ports are cut onsite and plugged with foam prior to final coatings applications.



Plumbing

Conventional plumbing components are utilized within GigaHouse. Holes or chases are cut onsite into the EPS insulation. Access panels, strapping and bracing may be attached to the steel studs in conventional ways. The completed plumbing may be foamed in place sealing off the pipes and adding thermal protection from freezing in extreme climates. Excavate plenty of foam around areas where heat is used to solder copper plumbing and protect the surrounding foam from melting. Replacing foam can be as simple as re-using the foam removed and/or using low volume expanding urethane aerosol foam found locally in big box stores.

Roofing

Conventional roofing materials are utilized over GigaHouse roofing panels and are mechanically attached through the insulation to the steel stud purlins @ 16” on center. Engineered trusses and purlins may be designed for heavy snow loads and Hurricane force wind loads or uplift. Steel trusses are preferred however the use of engineered wood beams and trusses is acceptable. Connecting trusses to GigaHouse anchors remain the same.

Kitchen Cabinets/Millwork

Steel framed principals are used within the walls with studs typically 24” on center. Therefore, just like a wood or steel framed house, anchoring into studs is a preferred method of attaching millwork or cabinets to GigaHouse walls. Finding studs either by measuring incrementally from a know stud location or with a magnet is fast and easy. Drilling into PlasterMax with an ordinary masonry drill bit is necessary, do not attempt nailing. Door and window moldings can be glued or screwed into metal frames surrounding all doors and windows.

French cleats may be attached first to the wall studs after PlasterMax has fully cured and the millwork then attached to the cleats. Shelving in pantry and closets should only be attached to the studs using self drilling, self tapping type screws such as Tapcon screws.

ASSEMBLY PROCEDURES

TRACK LAYOUT

Assemble bottom tracks and locate on slab. Careful measurements are necessary to follow the dimensioned plans. Lay out the bottom tracks incorporating the water resistant 3.5"x 50ft Dow Sill Seal foam Gasket between the bottom track and the slab.



PANEL ASSEMBLY

Locate coded panels next to where they are needed as shown on the plans. Insert pre-cut foam panel into steel stud bottom track starting at any outside corner.



Insert studs and panel to panel inline connectors. Connectors fit into the bottom track and fit flush with the top of the panels.

BRACING

Laser level and brace walls before adding roof trusses.



ROOF TRUSSES

Roof trusses added to top plate after building all walls. Brackets supplied with GigaHouse are used to connect the trusses to the top track and also to the hurricane/seismic anchors where applicable.



ROOF TRUSSES

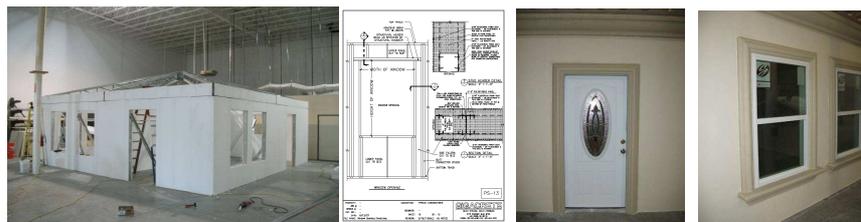
Roof trusses added to top plate after building all walls. Brackets supplied with GigaHouse are used to connect the trusses to the top track and also to the hurricane/seismic anchors where applicable.

Roof panels are laid onto trusses and studs slid into location holes cut into foam panels.



DOORS AND WINDOWS

Install doors and windows and screw into steel studs at openings. Install flashing and window/door trim.



ROOF INTERIOR FINISH

Install interior foam sheets to cover exposed steel purlins and connectors and install truss covers where specified.



ELECTRICAL

Cut out foam where boxes are to be installed and pull wires through panels and make connections. Voids are filled with expanding foam and trimmed flush when cured.



INTERIOR TRIM

Window and door trims are added, screwed into steel studs, patched and ready for paint.



INSTALLATION OF 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** 4.5 ounce (minimum) to 11 ounce fiberglass mesh typically used in the EIFS industry is a critical part of the **PlasterMax™** or **StuccoMax™** application. A 1/8" coat of **PlasterMax™** or **StuccoMax™** is applied to the EPS and worked reasonably flat. Pre cut the mesh and embed into the first coat working material through while ensuring that the mesh is flat and free of wrinkles. 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.
- Spraying** **PlasterMax™** or **StuccoMax™** may be applied by hawk and trowel but spray application is recommended for best results. 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.
- 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.

Delivery Equipment

Hopper Gun

Hopper texture guns may be used to apply **PlasterMax™** or **StuccoMax™**. Hopper guns are typically used on smaller volume projects and for producing textures. Air pressure, air flow, material viscosity and orifice size depend upon the application intention.

Peristaltic Pump

Portable Peristaltic pumps or "Squeeze Pumps" offer automation to the installation and greatly increase application efficiency. **PlasterMax™** or **StuccoMax™** never interfaces with pumping parts reducing the set up and wash out time and minimizes required maintenance. Peristaltic pumps deliver material safely and effectively.

Rotor Stator Pump

Portable progressive cavity or rotor stator pumps offer the similar versatility and performance as peristaltic pumps and may be used to deliver **PlasterMax™** or **StuccoMax™**. However, more attention is required with respect to maintenance, set up and clean out time

Spray Specifications

Nozzle	Material Orifice	Air Orifice	CFM	Max Hose Length
Blow cap	1/4"	1/8"	4	50'

Note: use a "dash" or fine spray pole assembly when spray applying **PlasterMax™**

Surface Protection and Decoration

Paint

Wall paint is most commonly used to seal, protect, and provide a consistent decorative finish to cured **PlasterMax™** or **StuccoMax™**. Breathable latex primers and paint typically used for conventional veneer plasters are recommended after a minimum 7 day cure period. In cooler and/or more humid environments additional cure time may be needed before painting. Consult with the paint manufacturer for recommendations.

GENERAL

Clean Up

All mixing and finishing equipment must be thoroughly washed immediately after use. Potable water is sufficient for cleaning.

Curing

Ensure that **PlasterMax™** or **StuccoMax™** is allowed to cure in temperatures within the application temperature and humidity ranges.

Coverage

Each 75 lb. (34 kg) of **PlasterMax™** covers approximately 42 sq. ft. at a thickness of 3/16 in and 45 sq ft. for **StuccoMax™**.

Storage

PlasterMax™ or **StuccoMax™** bags should be stored in a secure, indoor and dry space. It is important that bags maintain their seal and are free of puncture or tear. **PlasterMax™** or **StuccoMax™** should be brought to room temperature prior to being mixed and applied.

Shelf Life

When properly stored in original sealed packaging, **PlasterMax™** or **StuccoMax™** has a shelf life of one year from the date of manufacture. For safety sake please keep away from children.

Tech Support

Contact GigaCrete, Inc. at (702) 643-6363 (PST) or (508) 294-8249 (EST)