

How to build a Modular Home with shipping container

Secure a shipping container, make sure that any dirt, dust, or other forms of debris are removed from shipping container. Inspect both the inside and outside of the shipping container for signs of rust or corrosion.



MEASURING CONTAINER PER PLAN

While custom size windows are available, typically, shipping container windows are 2x3-foot windows with a top and bottom pane or 3x3 feet double-sized, multi-paned windows.

Custom Wall Openings & Clear Span: Wall openings are cut up to an 8' x 8' opening and reinforced by 2" x 2" steel tubing. A clear span uses this opening and connects one container to another to create a larger space between them.



MODIFICATIONS (CUTS)

Shipping containers have monocoque bodies. The corrugation panels (roof, sides, and back), floor, purlins, front doors, frame, and rails form an integrated structural skin. They are strong and made to carry floor loads far more than what is required for typical home construction. But, when you modify them, cutting holes or penetrating members, they are weakened. Regardless of what level of modification your shipping container home design calls for, it is recommended to review with a structural engineer or architect. Cut openings for door and windows using a plasma metal cutter.



BEAM INSTALLATION PROCESS

The installation process is quite straightforward and simple. It does, however, get a little repetitive when installing 12 lengths of 12m beams to cover the ceilings of both 40ft containers.

The spacing between beams depends on your ceiling type and beam sizes etc. It's important to ensure that you have a beam at each wall intersection and not to have a beam running down the center of the container to allow for the installation of lighting and appliances.



Install windows, exterior doors, flashing, and any sky lights. Windows are set into openings that were measured and cut prior to delivery of the shipping containers or roughed out on site. All openings for windows and doors should be framed with a steel section. Hollow rectangle sections work the best, but an L section will work as well. Images below show openings for sliding door systems in the end.



Install interior framing, insulation, heating and cooling systems, plumbing, electrical, and rough out all fixtures.

Supertherm insulative coating, is sprayed on both sides of the remaining container walls. Supertherm is a high-performance, four-part ceramic coating that carries an R value of R-19 and adheres to the steel surface of the shipping containers. A 1/2-inch plywood floor over the existing 3/4-inch plywood sub-floor is installed. Metal hat channels for wiring are run along the walls and vertical support beams are secured.

Electrical & Lighting

From phone and data connections to overhead, porch, or floodlights, a custom shipping container's electrical and lighting component may be one of the most difficult for DIYers and may require hiring a professional to install. For more remote locations, consider LED lights. This environmentally friendly option only requires a smaller portable power source to power them instead of tapping into a main electrical grid.

Install Interior Framing as shown



Install heating & cooling systems as shown



Plumbing

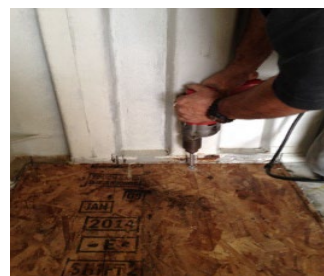
The plumbing line within the area is located. The line will most probably be beneath the area you've placed the container on. Using either the engineer or a water company contractor, the line is identified and marked for the next step. Once you can see the plumbing line has successfully been added to the house, connect to other portals such as the kitchen sink, bathroom, toilet, and other water outlets. From that central line, ensure that all pipes and taps are working well and arrange for an inspection. Run plumbing and electrical wiring to meet local code. It's time for a quick test on whether the plumbing line is working. Check the water supply if it's efficient and test if the water is draining well in the sink nor flushing in the toilet.



Plywood (sub)-flooring

Plywood boards are manufactured from thin layers of wood (veneers) glued together in a structure in which the wood grain of adjacent veneers is rotated by 90 degrees. Such composition results in increased strength and stiffness of the board compared to equivalent plain wood boards. Plywood is a traditional material used in the residential industry. Due to its low cost, and sturdiness, it is also used for floors of cargo shipping containers, although due to atmospheric exposure and insects it must be chemically treated. Shipping containers start with 1 – 1/8" thick marine-grade plywood and are then covered with:

- Rubber
- Vinyl
- Commercial grade carpet
- Steel overlay



Insulation:

In addition to plywood and fiberglass framed insulation, there is also rigid polystyrene panel insulation. Both types are available for purchase as part of modification kits. Insulating paint can also add another level of protection to your shipping container or closed-cell spray-in foam insulation is a great option as well. This is the most often suggested type of insulation. Add insulation between the outside and interior walls or use a spray-on Ceramic insulation inside or out. Putting insulation in the ceiling then covering it with drywall. Spray foam insulation is the only type that provides a seamless vapor barrier, which helps prevent problems such as mold and dampness. It is also the thinnest option at around 2 inches thick. Once insulated, the existing container walls are faced in drywall for finishing. Complete the interior finishing, Frame doors, windows, and interior walls.



Drywall

Drywall helps improve insulation and retain room temperature much better than many alternatives, making it an energy-efficient choice. It is also cost efficient as well as attractive. Its smooth finish gives a clean and unobscured feeling to the walls and provides a ready-to-paint surface. Drywall also outperforms other finish materials regarding fire resistance. Metal studs and drywall are used for interior partition walls. Drywall can be installed prior to transportation; however, it needs to be finished at the final location for the mud to not crack during transportation.



PAINT SELECTION

When it comes to selecting a paint for your shipping container, you'll want the best – even if you're just looking for protection. Prime the metal and then apply direct-to-metal water-based or acrylic paint. Make sure your choice of paint states it's 'for metal'. Container One has partnered with paint and coating manufacturer Sherwin Williams to offer customers the best shipping container paint in the market. This industrial grade direct to metal acrylic (DTM) paint is an interior-exterior, water-based, corrosion-resistant acrylic coating.

The paint can be applied by airless spray (recommended), conventional spray, brush, or roller. Two coats are recommended. Three gallons will cover one coat for 20-foot containers, and 5 gallons will provide one coat on 40-footers. Before you paint, clean the surface, grind down imperfections and straighten out dents and bumps that may have occurred previously in used containers or recently during shipping with new containers.



Exterior Finishing:

Complete the exterior finishing by adding a roof, paint the container, apply a stucco finish, or use fiberboard siding.



INSPECTION & SIGN OFF

Staged inspections through the build with contractor and building official - foundation, plumbing and electrical, architectural, and fire. } Put together final check/punch list for contractor } Review punch list with contractor } Final inspection with building official for certificate of Occupancy.



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