

Hurricane Retrofit Guide



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Narrow Walls Next to Garage Door Openings

Another area where modern wind resistant construction is significantly different from the typical ways homes have been built in the past, has to do with the narrow side walls next to garage doors on garages that stick out from the house. The walls being built today are much stronger than those built in the past. Winds pushing on the side of the garage will tend to try and push the end of the garage over. This has to be resisted by the short walls and the action of the roof and ceiling diaphragms. Typically, these walls are so short (less than 18 inches) that they are not very effective in resisting these loads unless special care was taken to make them extremely strong and well anchored to both the foundations and to the beam running across the top of the garage door opening. Several manufacturers make kits that can provide the kind of strength required provided they can be properly anchored into a strong foundation and into the framing above the door. This type of retrofit would require removing the garage door and making significant modifications to the walls. This should only be done by a professional contractor.

Instead of having one of the kits installed, it is possible to add some extra strength to these narrow walls, and this is easiest if they are wood frame walls. This can be done by strapping the existing framing together if the strapping is not already there and installing a layer of $\frac{3}{4}$ -inch plywood (cut into an L shape) up the side of the wall and across the top of the door opening, on each side of the door. You want to use a single piece of plywood to form the L so that it is continuous around the corner at the top of the door opening. This makes the plywood act like a large angle bracket that helps keep the corner from distorting. Install some form of hold downs to anchor the wall studs at the base of the wall to the foundation. Then cover the bottom of the wall with additional pieces of $\frac{3}{4}$ inch plywood. There is usually no need to install additional plywood over the top of the garage door opening (beyond the end of the "L") since there is a large beam over the door and the ends of the plywood "L's" will be attached to that beam. Applying an AFG-01 approved wood adhesive and attaching the plywood using nails or deck screws is a belt and suspenders option.

For **wood frame walls**, all the plywood should be nailed around the edges with 8d (2-1/2" long) nails [or a 2-1/2" #8 deck screw] at 3" spacing and at 6" spacing along any framing members that fall in the middle of the

plywood sheets. If you try to install 3/4" plywood over the inside of **un-finished masonry walls**, the sheathing should be attached to the masonry using 3/16" diameter by 1-3/4" long masonry screws at about 6" spacing around all of the edges of the plywood. A second layer of plywood should be attached over all joints between the plywood sheathing installed on masonry walls. This type of retrofit will not provide the strength of the kits. However, on wood frame walls it has been shown to at least double the capacity of the original wood frame wall to resist lateral loads. It is not known what kind of increase will be provided in the masonry wall case.

If there are enough full height and jack studs beside the garage door in a wood frame house, it may not be necessary to have the garage door removed. One could cut slots in the 3/4" plywood to facilitate installing the plywood where the garage door track mounting brackets are located on the wall.



If the garage door is to be removed for this retrofit, and it has a coil spring, the removal should NOT be attempted by anyone other than a professional garage door mechanic. These coil springs are very powerful, dangerous, and can kill.



Preparation of a test specimen for testing at Clemson University - this is the baseline structure built the way many garage door openings are framed when conventional construction (not high wind construction) is followed.

(click image for larger version)



Adding strapping to tie all of the framing members together was the first step in the retrofit

(click image for larger version)



An AFG-01 rated wood adhesive was applied to improve the connection of the sheathing to the wall studs

(click image for larger version)



A plywood L was applied around the top of the garage door opening - plywood was added over the top of the opening for aesthetics but it was not needed to improve the structure.

(click image for larger version)

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