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Wind Resistance of Masonry Walls

Modern reinforced masonry wall houses have been found to perform quite well in hurricanes. However, un-reinforced masonry houses can be dangerous because they tend to fail suddenly and catastrophically. Masonry houses make use of both the reinforcing steel and their roof diaphragms to preserve their structural integrity. Keeping the roof in tact is very important for all houses, both because it keeps the wind and rain out and because it provides critical support for the top of the walls. Masonry walls that are not braced at the top of the wall are notorious for blowing over in strong winds.



When the roof sheathing on the gable end was torn off, the top of the gable end wall was left un-supported and broke over above the bond beam.

[\(click image for larger version\)](#)

Roof to wall connections and what you can do to strengthen them: In houses with masonry walls, it is common to find a wood plate that is bolted or strapped to the top of the masonry wall. The trusses or rafters are then connected to this plate using toe nails and, in wind resistant construction, metal straps. In newer wind resistant masonry construction, the board may be missing and the straps may be embedded directly into the top of the concrete wall (in a bond or tie beam) and the trusses and rafters will be set directly on the walls with a metal plate or some other sort of moisture barrier between the top of the wall and the wood. In early applications of straps, it was considered sufficient to use straps on every other truss or rafter. Today, every truss or rafter is anchored with a strap if the builder is following high wind construction guidelines. For guidance in determining how well your roof is attached to your masonry walls, click on [Masonry Wall Roof-to-Wall Connection](#).

Concrete masonry block walls and what you can do to strengthen them: If you have a concrete masonry block home there are a couple of techniques for determining how well the exterior walls are reinforced and anchored to the foundation. These are described in the [Masonry Wall Checklist](#).

What you want to find is steel in the top row of blocks, steel coming down the wall at least at corners and openings for doors and windows over 5' wide, and steel going down to the foundation. Older homes may have very little or no vertical reinforcing. The evolution of vertical reinforcing in masonry walls is from no vertical steel; to the use of steel in the outside corners; to adding steel at one or both sides of wide openings such as sliding glass doors or garage doors; to steel at one side of even more openings and occasionally interspersed along long walls; to today's standards of steel at every opening and regular spacing on all exterior walls. In many cases, the steel bolts holding a top plate to the wall are just grouted into the top one or two blocks in the wall. We have seen roofs lift off with a few blocks left attached to the J bolts and the rest of the walls just a pile of rubble.

If your masonry walls are un-reinforced, click on [Masonry Wall Reinforcement](#) to explore ideas about how you can strengthen the walls.

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