

Ask Jon Eakes

Tying the house down for earthquakes -- Shear Walls

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A couple of years ago we went to Canada's primary earthquake zone, Vancouver, and saw a lot of details about how hot water tanks and just about everything else in the house can and should be tied down to avoid damage during an earthquake. This time we went to near-by Victoria to see how to strengthen the house itself during construction with a 'shear wall'. A shear wall is a super reinforced section of the wall that will prevent racking in any direction and that also ties the top of the house securely to the foundation. This is special construction that looks very strange if you don't live in earthquake country. You can see the two massive columns in the first photo. Multiple 2x6's hold everything up, and large tie rods run from the upper story top plate down into concrete 4 feet into the ground to hold everything down, with fire stopping at each floor in this job. On the outside you can see the tight nailing pattern that makes the plywood an integral part of the shear wall. You can see a hole in the bottom of the first photo, and again several such holes in the last photo. Because a shear wall is so tightly nailed, there is no breather space between plywood panels -- hence the breather holes to make sure that moisture can escape from the inside cavity. Shear walls are not improvised but rather are designed by structural engineers and carefully constructed on site. Shear walls are also being used in areas not subject to earthquake codes such as in Alberta for what they call 'tall wall' construction -- two story or higher walls that do not have connecting floors or inner walls to strengthen them.

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