



Structural Engineers Association of Southern California

CALIFORNIA STRUCTURAL ENGINEERS URGE HOMEOWNERS TO TAKE ACTION NOW TO BOLT FOUNDATIONS AND FURNITURE FOLLOWING RECENT BAJA CALIFORNIA EARTHQUAKE

APRIL 7, 2010, SAN DIEGO, CA – Members of the Structural Engineers Association of California (www.seaoc.org), the premier professional organization of practicing structural engineers in the State, are urging homeowners to bolt their home's foundations and take other measures to protect their property following the magnitude 7.2 earthquake which struck on April 4, Easter Sunday, in Baja California.

According to SEAOC's Jim Amundson, head of the association's PR committee, "If California residents would follow some simple basic steps today to prepare for such earthquakes, they will be better able to avoid damage to their homes, families and belongings that could occur if a similar quake hit closer to their region."

"The good news is that basic earthquake problems in most houses, both structural and nonstructural, can be remedied in a majority of cases through easy and inexpensive means," said Mr. Amundson.

Specifically, the Structural Engineers Association believe that homeowners need primarily to answer four basic questions before the next earthquake in their area:

1. Is my house securely anchored to its foundation so that it won't slip during an earthquake?
2. Are there exterior hazards such as loose chimneys that need attention?

3. Are there interior hazards such as loose water heaters and unsecured furniture that create a safety hazard for my family?
4. Do I need the opinion and advice of a professional engineer and where do I find the right expert?

Foundations Are the Number One Issue

Wood-framed houses that are not adequately anchored or bolted to their foundations and/or have un-braced cripple walls in the crawl space are in danger of sliding off their foundations during an earthquake, severely damaging or destroying the building.

Unbolted foundations: Adding bolts to connect unsecured wood-framed houses to their foundation is one of the most important steps toward earthquake safety. This can be done by a contractor, or anyone skilled at home maintenance. If you, the homeowner, are not sure whether the foundation is bolted already, you should look for bolts at the base of the stud wall where the wood mudsills sit directly on top of the concrete foundation. Such bolts should be no more than 6 feet (1.8 meters) apart in a single story and 4 feet (1.2 meters) apart in a multistory building.

If your home's first floor crawl space foundation has been damaged in the past or it was built in the "pier and post" style, it may be necessary to consult a licensed contractor or civil / structural engineer about replacing it with a continuous perimeter foundation.

Un-braced cripple walls. If your wood-framed home has a crawl space beneath the first floor, the individual short studs supporting the first floor, called "cripple" studs, should be sheathed together with plywood panels to make a sturdier wall. You or a licensed contractor can strengthen the cripple walls relatively inexpensively.

Soft first stories. Many two-story homes in earthquake-prone areas of California have large garage door openings or other large open window spaces in their first floors walls. When the home is not designed correctly, structural engineers call these "soft stories." Some hillside homes built on stilts also have perilous foundations. In cases of soft first stories and raised foundations, it's advisable to consult a licensed professional architect, contractor or civil/structural engineer to

make sure your building is adequately braced.

Exterior Hazards Need Your Attention

Un-reinforced masonry. In some parts of California, many homes have been built with brick or block exterior walls with little or no reinforcing steel. These homes need to be reinforced. Some communities have programs for retrofitting un-reinforced masonry buildings so check with your local building office. One solution to this problem is to add an internal steel frame and bolt the walls to the steel frame. Even in wood-framed homes, inadequately braced brick chimneys can also be a problem. It's important, therefore, to consult an expert to determine if your home's exterior brick walls and chimney structures are safe.

Interior Hazards Are Easily Remedied

Nonstructural deficiencies. Inside one's home lurks many potential hazards such as an un-braced water heater, exposed brick walls, open shelves, tall furniture and unsecured mirrors and other wall hangings. If not properly secured, these items could themselves break during an earthquake, but more importantly they could cause severe injury to your family members if they topple. Fortunately, most of these problems can be mitigated (or protected against failing during an earthquake) with the use of simple metal clips and straps that can be purchased at a local hardware store, to secure items in place.

Locating a Professional for Advice

Civil engineers, structural engineers and architects are trained and licensed to provide information about structures. Geologists, foundation engineers, and geotechnical engineers are trained and licensed to evaluate the soil conditions the structures sit on and recommend appropriate action.

Make sure that you select the right expert and choose someone whom you can trust. This individual will be reviewing your problem, providing plans and a scope of work as a remedy. A good place to start is to call a [professional organization](#) such as SEAOC and ask for information about individuals who work in your area and handle the kind of problem you have.

For more information about these and other steps homeowners can take, there are many available resources online. SEAOC, in fact, participated in the development of two brochures on earthquake safety called “Putting Down Roots in Earthquake Country.” One concentrates on Southern California earthquake issues and the other on Northern California earthquake issues. They can be found at www.earthquakecountry.info/roots. SEAOC also has its own earthquake safety website at www.celebratingeqsafety.com which provides information about what causes earthquakes, why buildings fail and more about the structural engineering profession.

The Structural Engineers Association of California (www.seaoc.org) is a nonprofit organization of nearly 4000 members dedicated to advancing the structural engineering profession, protecting public safety in the built environment and serving the business and professional needs of the membership.

For more information or an interview, contact Patricia Coate, Media Contact for SEAOC at patriciacoate@mac.com or 415-309-2231, or Jim Amundson, SEAOC PR committee chair, jamundson@hopeengineering.com or 619-232-4673. Ext 219.

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