

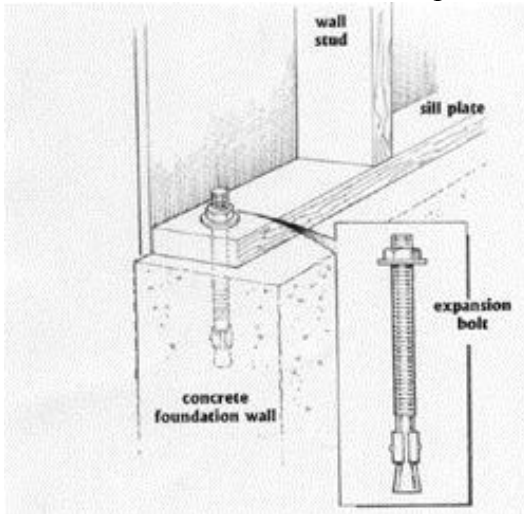
RETROFITTING YOUR HOUSE:

Wood framed homes have proven to be quite resistant to earthquake damage. It is unlikely that conventionally framed houses will collapse; your assurances of safety are greatly improved if the house remains on its foundation, and the roof, ceiling and walls remain connected. It is a good idea to contact a structural seismic engineer to answer any specific questions about your home.

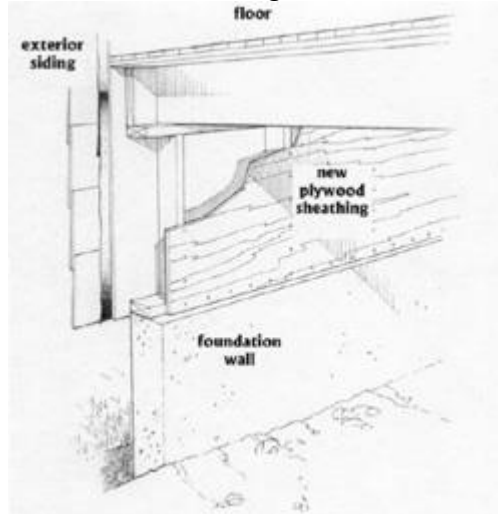
SECURING THE FOUNDATION:

Most residential structural damage is caused by homes sliding off their foundations during major earthquakes.

1. Check your house and garage for foundation bolts. These bolts secure the wood structure to the concrete foundation. They should be placed every six feet along the sill plate.
2. Using a hammer drill and a carbide bit, drill a hole every six feet through the sill plate into the foundation.
3. Place a ½” x 8” expansion bolt into the hole and tighten the nut.



Securing the Foundation



Cripple Walls

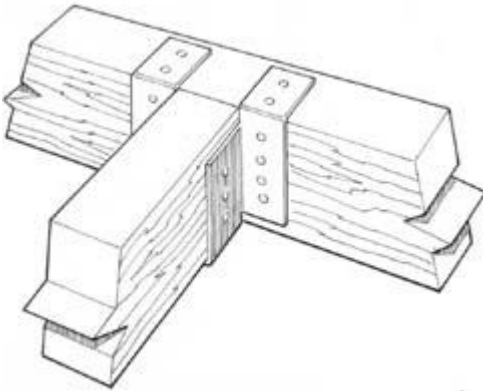
CRIPPLE WALLS:

1. Inspect the vertical studs that extend from the foundation to the first floor of your home. These are common in crawl space areas and are called cripple walls. IF they are exposed (for example, without sheathing) on the inside, they could buckle in the ground motion that accompanies many large earthquakes.
2. Strengthen the cripple walls by nailing plywood sheathing to the vertical studs, sill plate and top plate.

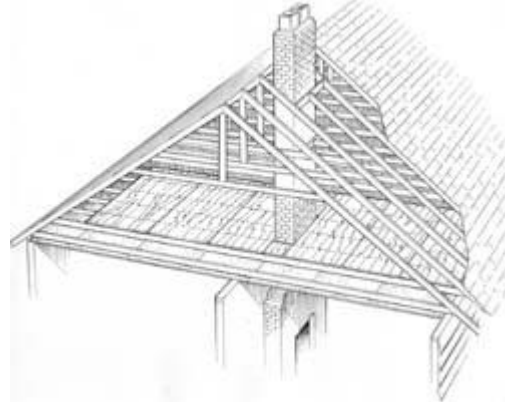
STRENGTHENING THE FRAME:

For a building to stay together in an earthquake, all its parts must be fastened together. Commercially available metal connectors (such as Simpson™ Ties) are used to strengthen places where beams, posts, walls, the floor and the ceiling join. These are available at most building supply stores.

1. Strengthen the connection between ceilings, walls, and floors using the appropriate hardware.
2. Inspect all exposed framing in garages, basements, porches, and patio covers. Strengthen this where necessary.



Commercial metal connector



Plywood around base of chimney in attic

CHIMNEY:

One of the most common types of damage from earthquakes is a toppled chimney. This becomes very dangerous when bricks penetrate the roof and fall to rooms below.

1. Check the chimney for loose tiles and bricks.
2. Reinforce the ceiling surrounding the chimney with $\frac{3}{4}$ " plywood nailed to the beams. This provides protection from falling bricks that might break through the roof.
3. If your chimney is old and extends more than five feet above the roof, consider bracing it. Check the yellow pages for an engineer who has experience in seismic strengthening.

BRICK & MASONRY FACADES:

Check all brick, masonry, and stone facades to make sure they are securely attached to your home. Consult a structural engineer for advice on how to do this.

WINDOWS:

1. Inspect all large plate glass windows to make sure they are made of safety glass
2. Consider adding a safety film to all windows. This does not prevent windows from breaking, but it does keep the glass from falling in and causing injury.

CAUTION: Retrofitting that is done improperly may actually CAUSE damage to your home during an earthquake. This information is provided to illustrate the types of structural retrofitting houses need to be safe. **THIS IS NOT INTENDED** to provide specific directions on how to do the retrofitting. Contact a licensed Structural Engineer who has experience in Seismic Retrofitting for information on how to retrofit your house.