



Understanding Problem Buildings

Studies show that most of the loss of life in future earthquakes in Southern California can be expected to occur in our older buildings. No building code is retroactive; a building is as strong as the building code that was in place when the building was built. When an earthquake in one location exposes a weakness in a type of building, the code is changed to prevent further construction of dangerous buildings, but it does not make those buildings in other locations disappear. Most buildings in Southern California have only experienced relatively low to moderate levels of shaking and many hidden (and not so hidden) vulnerabilities await the next earthquake.

To really know how a building is likely to perform when hit by strong shaking, you will need to hire an engineer to do a complete evaluation. But you can get a pretty good idea of where you stand by knowing 1) the type of construction (stucco-wood frame, concrete, steel, etc.), 2) the date of construction, and 3) whether it has been retrofitted. The following table gives a description of potential problems with general types of construction. The dates are for the standard building code. In 1989, the State of California passed legislation that required all jurisdictions to use the most recent version of the Uniform Building Code (before 1997) or International Building Code (after 1997). Before 1989, different cities may have adopted the Uniform Building Code at different times.

CONSTRUCTION TYPE	DATE OF CONSTRUCTION			
	Before 1935	1935-1976	1976-1997	After 1997
Wood frame buildings, with or without stucco	Probably not bolted to the foundation unless retrofitted. Can be completely destroyed. Adding bolts fixes the problem.	Raised first floors (buildings with a crawl space) usually supported by a cripple wall of just 2x4s, which can fail, destroying the house. Sheathing the cripple wall with plywood eliminates problems.		Some of our best buildings.
Unreinforced masonry (brick)	Not built after 1935. If not retrofitted, they are the deadliest buildings. When retrofitted, they are safer but still likely to be a complete financial loss.			
Concrete	Some of these buildings are OK and some are deadlier than masonry – only a structural engineer can tell you which one you have. Probably a complete financial loss.		Much less likely than pre-1976 to have big problems, but need an evaluation to tell.	Probably won't collapse but can have expensive damage in strong shaking.
Steel	N/A	Has the potential to collapse, killing many. Likely to have expensive losses. The problem is the welds that join the beams and columns. If they crack, the whole building can be lost.		Probably won't collapse but can have expensive damage in strong shaking.