Should You Buy a Home in Earthquake Country?

By Richard Stanley

Our hillside communities are famed for their thrilling views. These romantic heights did not rise by accident, however. The ground under our feet is moving imperceptibly--up, down and sideways. With this movement, build our hills--and also geologic stress, which causes cracking, or the proverbial fault lines. When this stress is relieved, we have earthquakes. If you live anywhere in California, earthquakes "come with the territory".

Locally, the most significant fault line is the Hollywood Fault, which runs mostly along Franklin Avenue, with a branch going north from Franklin and Western Avenues to Los Feliz Boulevard, thence along Cromwell Avenue. The Hollywood Fault is an extension of the Santa Monica Fault, which runs through Westwood, Santa Monica, then north along Malibu to the Channel Islands, and the Raymond Fault, which runs through the San Gabriel Valley. This fault system cuts through some of the most expensive real estate in America, including Beverly Hills. For many years, geologists considered the Hollywood Fault "inactive", but recent evidence, much of it a result of the digging of the Red Line subway tunnels, indicates that the fault is "potentially active", meaning it has moved sometime in the past 10,000 years. How likely is "our" fault to move? The seismic interval is estimated to be from 4,000 to 20,000 years, but the resultant shaking could be on a par with that of the 1994 Northridge Quake.

Certainly, the reality of earthquakes should be considered when buying real estate. Here are some factors to consider:

- Construction Type: There are two types of structures to avoid: unreinforced masonry and "stilt" structures. The morning of the Northridge Quake, I drove down Hollywood Boulevard dodging bricks that were thrown into the street by the partial collapse of many brick buildings. Despite earlier seismic retrofitting, these structures failed because bricks and mortar do not flex to absorb seismic energy--they crack and crumble. Later that morning, I viewed two stilt houses on Creston Drive that broke free of their foundations and went down the slope--one all the way to the street below. Here there was too much flex. These houses pulled loose along their horizontal anchors, which were termite-riddled, and their stilts racked. Two persons were killed during that quake in a similar house in Sherman Oaks. Generally, the most earthquake-resistant type of construction is frame and stucco, as it absorbs seismic energy better than other types.

- Age: Many homes were thrown off their foundations during the 1933 Long Beach Quake. As a result, the state-wide building code was made more stringent. After about 1935, all new homes in California were required to be bolted to their foundations. Since then, the bolting requirements have improved many times--often as a result of new post-quake findings. If you are buying an older home, especially

one built pre-1935, ask your home inspector if the home is bolted, and, if so, to what standard. Generally, the newer the home, the tougher the building code standard for earthquake resistance. However, after the Northridge Quake, I saw newer homes condemned, or "red-tagged", beside 1920s homes that were not tagged.

- Seismic Retrofitting: If you own an older home, there may be many things you can do to ready it for the next earthquake. Bolting to the current standard should be considered. Many homes have raised, perimeter foundations with cripple walls (the connecting walls from the masonry foundation to the floor plate above). Cripple walls can rack in an earthquake if not reinforced with wooden shear panels on the insides of the walls. The installation of shear panels is a common, and relatively inexpensive, retrofit job. Whatever you decide to do, consult a professional and pull appropriate permits.

- Design: Generally, the more stories, the more potential earthquake hazard. Low and wide houses generally perform in earthquakes better than tall and thin ones. Note if the house has a "soft story", a living area over a large lower opening such as a garage or porch. Soft stories can rack or collapse in an earthquake, but they can be reinforced, too. When in doubt, consult a structural engineer.

- Geology: Be sure the seller of the house you purchase provides you with a Natural Hazard Report by a reputable company. Check the earthquake-related findings. If you have any doubts about earthquake faults or soil conditions relative to a particular house, a report from a geologist may be in order. These reports can be quite comprehensive--and expensive. The peace of mind you can gain as a homeowner may well be worth the cost, however. Findings can vary dramatically from house to house, too. I once sold a house next to vacant lot, where a house had slid off its foundation. My client's geologist thought that, while the house and lot my client purchased was fine, the vacant lot was geologic "chaos". A McMansion now sits there--but for how long?

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