The evolution of earthquake safety, preparedness

Larry Collins, Los Angeles Newspaper Group, 2-23-11

Collins is a battalion chief with the Los Angeles County Fire Department and a member of the department's Urban Search and Rescue team, which was deployed to the Haiti earthquake last year and the Christchurch earthquake in New Zealand this week.

This week's earthquake disaster in New Zealand is one more reminder that even in a locale where seismic risks are well understood and planned for, an earthquake fault rupturing close to the surface - with an epicenter close to large metropolises with older construction - can be disastrous. Los Angeles County firefighters now conducting search and rescue operations in Christchurch are helping save lives in just that situation for the second time in just over a year.

In Haiti last year, as it is in Christchurch now, the county Fire Department's Urban Search and Rescue team is applying the many lessons we've learned since the deadly Sylmar earthquake hit four decades ago this month, reawakening Southern California to the realities of living in quake country.

The first lesson is preparedness, which depends on being able to understand the hazards facing us. Although science does not seem much closer to the elusive goal of predicting quakes, early warning systems are being developed, with the promise of giving us precious seconds to get to safe places and/or to "drop, cover and hold on" before shaking begins. The farther from the epicenter you are, the more early warning you can get.

Southern California's building ordinances, already among the most stringent in the world, have been strengthened in distinct phases since the Sylmar quake. Today, buildings in southern California are far less vulnerable to collapse, and the biggest threat is often non-structural objects that can injure people.

Likewise, public education has improved dramatically since the Sylmar quake and has been made more powerful by efforts to mobilize the public into action, a recent example being the series of statewide annual Shakeout earthquake exercises that have been conducted since 2008.

Research - and the experiences of rescuers crawling through thousands of collapsed buildings in domestic and international disasters - have shown firefighters and urban search and rescue teams that building collapses leave characteristic "survivable void spaces," gaps just large enough for a live human to be shielded from the collapsing debris. The "drop, cover and hold on" method maximizes the potential of ending up in a survivable void space.

The Sylmar earthquake spurred efforts to improve rescue capabilities, and the 1987 Whittier earthquake seeded development of the now-ubiquitous discipline known as "urban search and rescue." Then the 1989 Loma Prieta earthquake revealed the need for the federal government to have a nationwide system of large, quickly deployable, highly trained and experienced urban search and rescue teams that can be sent to assist any state overwhelmed by a disaster. By 1992, that system was in place. The United States has 28 FEMA urban search and rescue task forces that respond to disasters across the country. Two of these teams (from the Los Angeles County Fire Department and the Fairfax County Fire Department in Virginia) are designated to respond internationally under the auspices of the U.S. Agency for International Development. And that is how L.A. County firefighters ended up applying the lessons from Sylmar to the catastrophe in Haiti.

On Jan. 12, 2010, Ginette Saintfort had just stepped into a parking structure in Port au Prince when the earth

began bucking and twisting. The building collapsed, crushing her hands. She was trapped in a survivable void space without the use of her hands to signal for help, attempt escape or even to drink water, if she had had some.

The U.S. dispatched the L.A. County urban search and rescue team, called "USA-2," from its base in Pacoima. The team conducted rescue operations around the clock for nearly three weeks. They often spent hours tunneling vertically downward through several thick, reinforced concrete slabs, or horizontally through walls and mountains of debris to reach survivors using tools, training and experience gained since the Sylmar quake.

On Jan. 17, looking through a gap in a collapsed parking structure, firefighters saw the face of Ginette, who by that time had been trapped for five days with no food, water or light. Hours later, after being freed by L.A. County firefighters conducting a major tunneling operation, Ginette's first words were, "Thank you, God." Then she broke into song, singing as strongly as anyone could. It took a few seconds for rescuers to realize it was a sort of Gospel song, "Don't Be Afraid of Death." The scene was captured by a British film crew and broadcast around the world.

Ginette's vibrancy, her tenacious grip on life, her sense of humanity even in the face of despair and her faith in something larger, was something we've witnessed in countless disasters and emergencies here in the United States. It is perhaps the most important lesson we've learned since the Sylmar quake.