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## DPD gearing up again to require retrofits of unreinforced buildings

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Seattle is looking at requiring seismic retrofits for unreinforced masonry buildings to try to reduce the risk that they will collapse during an earthquake.

**Tying walls to the floors and roof with bolts offers the most bang for your buck, says structural engineer Jim Collins.**

Bryan Stevens, a spokesman with the city's Department of Planning and Development, said recommendations should go to the City Council by the end of this year, and legislation is expected by mid-2013.

Based on a "sidewalk survey," city officials determined there are about 800 buildings with unreinforced masonry in Seattle. It estimates 10 to 15 percent have been seismically retrofitted to some degree.

The unreinforced buildings are commonly found in the commercial cores of older neighborhoods such as in Pioneer Square, Chinatown/International District, Columbia City, Capitol Hill and Ballard. They were built without steel reinforcement, and without adequate ties and connections between the structural elements.

After the Nisqually earthquake in 2001, two-thirds of the buildings that were determined to be unsafe to immediately enter were those with unreinforced masonry.

"We want to reduce the risk of collapse in these buildings, help aid in the preservation of these buildings, which tend to be historic or character buildings, and then increase the level of resiliency in these buildings after an earthquake event," Stevens said.

The city currently only requires seismic upgrades as part of a substantial remodel or an increase in occupancy. Those upgrades generally do not bring the structures up to the code for new buildings, but help stabilize them enough to reduce the chance of collapse in an earthquake, Stevens said.

The city began looking at the issue before the recession, but Stevens said there was not enough money during the downturn to do the policy work.

DPD established a technical advisory committee of engineers, architects, building owners and other stakeholders who proposed standards for retrofitting unreinforced masonry buildings. The standards are similar to San Francisco's "bolts plus" minimum.

The main element is tying masonry walls to the floors and roof with bolts. A building could still be heavily damaged, but the risk of injuries and building collapse is reduced.

Stevens said the committee also recommended that buildings with a "soft story" at the lower level — meaning lots of windows or other openings — be required to get a structural evaluation to determine if lateral bracing is needed in addition to doing the "bolts plus" work.

Jim Collins, a structural engineer with PCS Structural Solutions, said the bolts-plus work and lateral bracing in a 20,000-square-foot building with a soft story could cost \$400,000 to \$600,000. "For a typical building in Pioneer Square, it would probably be half a million or more," he said.

Collins said the hidden cost is in removing tiles, drop ceilings, roofing, flooring and duct work to install the bolts.

The bolts-plus approach is a partial retrofit, Collins said, but it offers “the most bang for your buck.”

Ninety-five percent of the failures of masonry buildings in the Northwest are from walls not being bolted to the structure, he said.

Stevens said a policy group is looking at ways to offer financial incentives to building owners who are required to do the retrofits.

“What we don't want to see is a requirement that is so onerous ... that people choose to leave these buildings vacant or demolish them,” he said.

A city policy committee is helping to develop recommendations for retrofits as well as incentives, penalties, financing options, and a schedule.

Its next meeting is at 8:30 a.m. April 26 in Seattle Municipal Tower's Room 4050. The meeting is open to the public.