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Shaking things up: first-in-the-nation earthquake technology at new CPMC Van Ness Campus hospital

Viscous wall damper technology, used in dozens of construction projects in Japan, proven to substantially decrease building movement during earthquakes

SAN FRANCISCO (Jan. 28, 2019) – Sutter Health's new California Pacific Medical Center (CPMC) Van Ness Campus hospital includes first-in-the-nation seismic technology, which is designed to allow it to withstand a major earthquake. The 11-story structure incorporates 119 innovative viscous wall dampers which absorb very strong movement and reduce overall stress on the building. This technology has been used in dozens of construction projects in Japan – including many high-rise buildings – over the past 25 years. These are the first ever viscous wall dampers incorporated into a building in North America.

"Geologists say there's a 72 percent chance of a magnitude 6.7 earthquake along the Hayward Fault and other Bay Area fault lines within the next 30 years," said Jay Love, senior principle engineer at Degenkolb Engineers and the engineer of record for the project. "With the latest seismic technology in place, the new CPMC Van Ness Campus hospital is prepared to continue to deliver healthcare services when the next 'Big One' strikes."

San Francisco's new California Pacific Medical Center (CPMC) Van Ness Campus hospital is located at 1101 Van Ness Ave. at the intersection of Geary Blvd.

Based on stringent testing and analysis, viscous wall dampers absorb approximately 90 percent of the energy from an earthquake. When minor or even violent shaking begins, the dampers go into effect. This substantially decreases building movement, especially in the upper floors where seismic accelerations are typically the greatest. In the event of a major disaster, Sutter's CPMC Van Ness Campus Hospital is built to sustain itself for at least four days off the city utility system, with the support of three emergency generators, food, water and the ability to safely store sewage.

Installation of the dampers has reduced the structure's reliance on steel alone to strengthen the building. Without it, the hospital would have required up to 60 percent more steel and more bracing frames on the column lines of the building. Factoring in the cost of the dampers with structural steel, Sutter Health saved 25 percent on the total cost of the building's structural steel, money that was able to be used in other areas of the project.

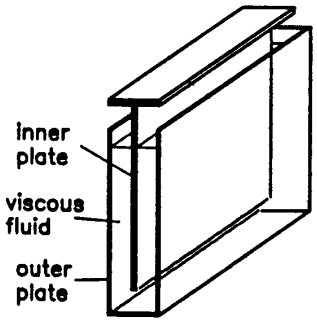
In addition, the dampers are strategically located between windows on the exterior of the building's façade, allowing for unobstructed views and access to exterior light in every patient room.

By employing viscous wall damper technology, we've created one of the most earthquake-resistant buildings in all of San Francisco," said Larry Kollerer, Sutter Health's executive director for facility and

property services. “In the event of a major disaster, the new CPMC Van Ness Campus hospital is designed to not only remain standing, but to be operational to serve the needs of the community in a time of extreme crisis.”

HOW IT WORKS

Viscus wall dampers are made of two pieces. The first is a simple steel box that fits into the width of the exterior wall space and connects to the floor girder below. The second is a vertical steel plate that inserts into the steel box and is connected to the floor girder above. The plate is free to move horizontally through a polymer viscous fluid in the box. The fluid, polyisobutylene, is a synthetic elastomer that absorbs the earthquake’s energy when the plate pushes its way through the fluid as floors move horizontally from one another.



Viscous Wall Dampers, like this one, will allow the new CPMC Van Ness Campus hospital to withstand a very strong earthquake.

The Office of Statewide Health and Planning Development (OSHPD) required vigorous testing and analysis to demonstrate that the new hospital would perform as well – if not better – than a conventional California hospital during a major earthquake. Full-scale testing of the technology took place at the University of California San Diego’s Caltrans Seismic Testing Facility, where six full-scale dampers were put through more than 20 tests. After reviewing the results, OSHPD agreed that the system met the requirements needed for hospital construction in California.

In response to urgency created by the events of California’s Northridge earthquake in 1994, and because of the total collapse of two hospitals during the Sylmar earthquake of 1971, the California State Legislature introduced a Seismic Safety Bill—Senate Bill 1953—which was signed into law by Governor Pete Wilson in 1994. The new law required nearly half of California's hospitals to be retrofitted, reconstructed or closed by 2030 if they were unable to meet the new seismic safety requirements.

For more information about the Sutter Health network visit: sutterhealth.org | facebook.com/sutterhealth | youtube.com/sutterhealth | twitter.com/sutterhealth.

MEDIA PLEASE NOTE: For a tour of the hospital, high-res images or to request an interview with a Sutter Health executive, please contact Craig MacLellan at craig@landispr.com / (415) 359-2306. You may also contact the 24-hour media hotline at (800) 428-7377.

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