SUTRO TOWER® connection

THE NEWSLETTER FOR THE SUTRO TOWER NEIGHBORHOOD | JULY 2019

Yes, Sutro Tower Is Ready for the Big One

This year marks the 30th anniversary of the Loma Prieta earthquake, a magnitude 6.9 tremor that severely shook San Francisco and the region, killing 63 people and injuring 3,757 others. Most of San Francisco was blacked out for two days, but at Sutro Tower there was no damage and no loss of broadcasting capability, though some stations were off the air for 30 to 90 minutes due to individual power issues.

Since then, Sutro Tower, Inc. has spent more than $10 million on structural upgrades and retrofits to insure communications are not affected by an even stronger quake in the future – even one as powerful as the Big One of 1906.

The U.S. Geological Survey pinpoints the epicenter of the 1989 Loma Prieta quake as 60 miles south of San Francisco, at a depth of 12 miles. It lasted approximately 15 seconds. Some 12,000 homes and 2,600 businesses were damaged, along with the Nimitz Freeway in Oakland, the Embarcadero Freeway in San Francisco, and the Bay Bridge, with total damages topping $6 billion.

After 1989, Sutro Tower has spent more than $10 million on structural upgrades

For comparison, the 1994 Northridge earthquake in Southern California was a magnitude 6.7, while the calamitous 1906 San Francisco earthquake had a moment-magnitude of 7.9, according to USGS. Following structural upgrades in 1996, 2003 and 2007, Sutro Tower is now designed to withstand those forces.

"To explain," said Ronald Hamburger, structural engineer for Simpson Gumpertz & Heger, and Sutro Tower, Inc.'s engineer of

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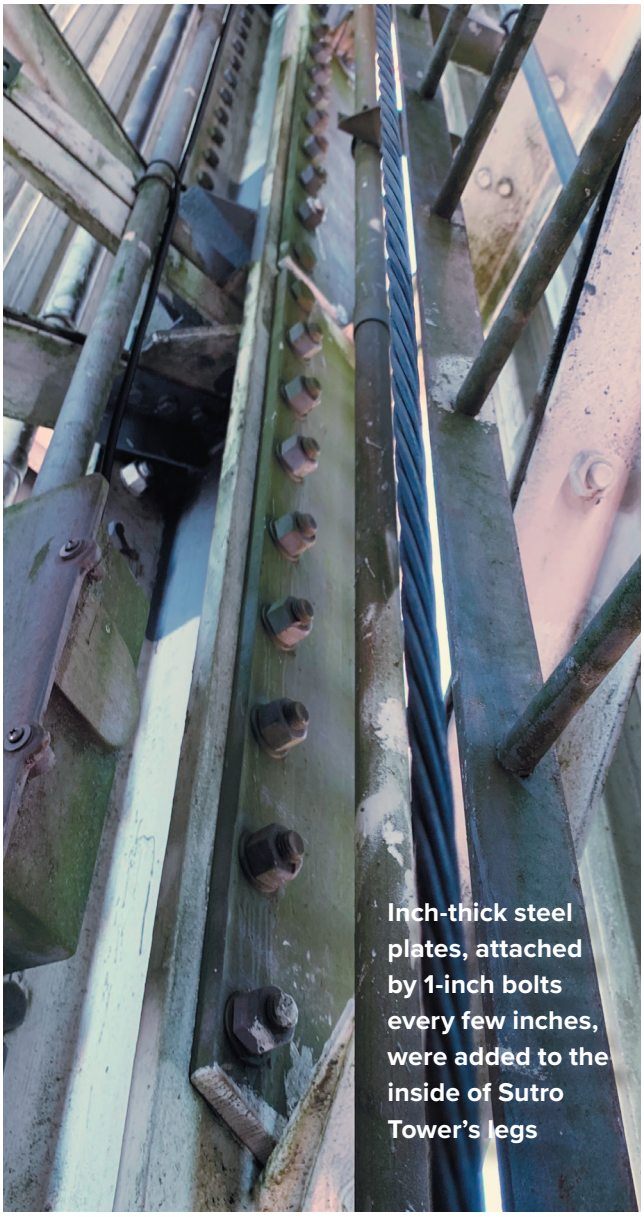

Inch-thick steel plates, attached by 1-inch bolts every few inches, were added to the inside of Sutro Tower's legs

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Sutro Tower Prepares to Add New Antennas

Sutro Tower, Inc. expects to start work next month to replace one of the three masts atop the tower and add new television antennas as part of the Bay Area's portion of the nationwide broadcast spectrum repack program. This work is necessitated by an act of Congress that mandates consolidation of television broadcast frequencies in a smaller portion of the radio frequency spectrum so that additional frequencies could be made available to broadband users. To comply with the Congressional mandate, all work must be completed this year.

Sutro Tower initiated design work for this project in 2016 and submitted initial permit documents to the City of San Francisco in late 2017. In recent months, Sutro Tower and its consultants have had extensive discussions with staff at the San Francisco Building Inspection and Planning departments. The Department of Building Inspection has received confirmation from a peer review committee of independent engineers that the new antennas do not trigger the need for structural upgrades of the tower. The San Francisco Planning Commission will take up the permit application for the new antennas later this month.

The new antennas and related equipment for Bay Area television stations already have been ordered from the broadcast manufacturer Dielectric LLC, in Maine, and most elements are in storage awaiting delivery.

Additional crews of tower workers to install the new antennas will be at Sutro Tower through December. The Federal Communications Commission has scheduled testing of the new antennas to begin in January, with a go-live deadline in March. When the repack project is complete, 30% of the radio frequency spectrum previously allotted to television broadcasting will be converted to wireless purposes, allowing the rollout of 5G cellular technology nationwide.

The Rescue 2 team on the ground, and using their safety gear to climb onto Level 6, 750 feet up.

Firefighters Practice at Sutro Tower

San Francisco Fire Department's "heavy rescue" team had a unique orientation session at the top of Sutro Tower. The team is trained to rescue victims at the most difficult locations in the city, including highrises, bridge towers, underground or on scaffolding. They came to Sutro Tower to familiarize themselves with onsite emergency equipment and access, to be prepared in case a tower worker should ever be incapacitated.

A Special Tribute at Sutro Tower's Base

Nobody went up Sutro Tower to work on the third Friday of April, though the weather was dry and a full crew was on hand. For the tight-knit fraternity of tower workers, it was a day of reflection, mourning and honoring colleague and mentor Steve Lemay on the anniversary of his on-the-job death when a tower collapsed in Missouri a year earlier.

Specially trained tower workers travel around the country and across the globe to maintain communications structures and install new antennas wherever they're needed. Lemay and his crew came to Sutro Tower frequently over the past 10 years; Sutro's safety and maintenance director Shane Best and three of the ironworkers onsite this spring formerly worked for him.

So on April 19, they put aside their tools and harnesses for a day of remembrance. They said a prayer at Ocean Beach, then went to lunch, then planted a pine tree in his honor near Sutro Tower's west leg.

"Steve was incredibly well respected by everyone – not just as a leader, but as a good person," said Best. "Everyone loved him."

Michael Kipling was on the ground and Tanner Klemann and Nathan McLeod were 105 feet up the Missouri tower with Lemay when it collapsed. "As soon as Steve hit the side he was working on, we heard noises that are not normal and knew something was up," Klemann recalled. "Steve told us to get down, and I guess he tried to fix it."

"It was just 90 seconds till the whole thing came down," said McLeod.

"I saw Tanner come down, then the top of the tower swayed, then we heard a creak and we started running," said Kipling. "It was too late for Steve to climb down so he tried to get into the man basket to 'ride down' the collapse, but there was too much force."

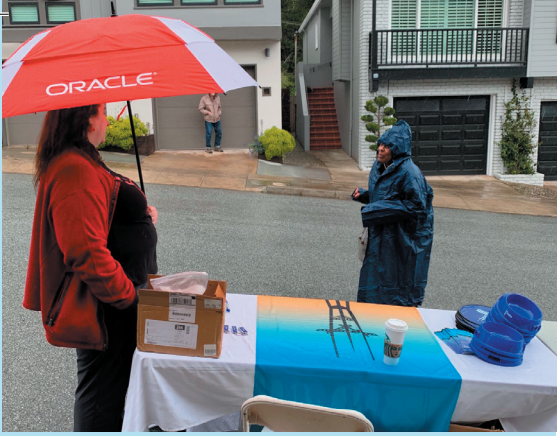
Shane Best, Michael Kipling, Nathan McLeod and Tanner Klemann at the memorial tree

Johanna McLeod, who worked for both Lemay and Sutro Tower, with a picture of Lemay (in blue) taken atop Sutro Tower. The picture has hung in Sutro's lobby for many years.

Lemay, who had majored in theology at BIOLA University and married his college sweetheart, was 56. He is survived by his wife, two children and a grandchild.

Gathering at the commemorative tree, Lemay's colleagues talked about working for him on towers from Maine to the Marshall Islands, including a top-secret facility sending signals to America's nuclear submarines. "It was an old wood tower that had never been retrofitted," said Kipling. "But Steve could teach anybody anything," said Klemann.

Best looked at the tree. "It'll grow tall and strong," he said. "Just like Steve."



Wet and Windy at Neighborhood Party

Rain and wind dampened the Forest Knolls Neighborhood Organization's block party this spring, but a representative from sponsor Sutro Tower carried on the tradition of giving away pens, flashlights and dog bowls while answering questions from residents old and new. Sutro Tower also sponsors the Midtown Terrace Homeowners Association block party in the fall, and a holiday party in December.

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Questions? Visit www.sutrotower.com/for-our-neighbors/, or contact Sutro Tower Chief Operating Officer Eric Dausman at 415-681-8850 or info@sutrotower.com.

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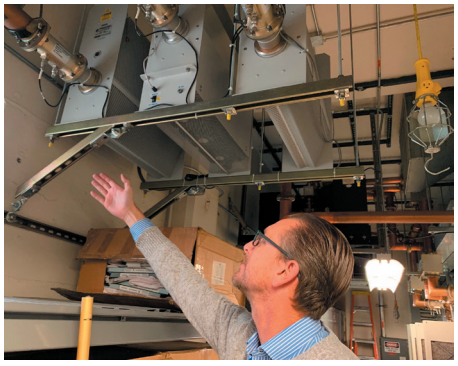
Earthquake FROM PAGE 1

record, "at the Sutro Tower site, the peak ground acceleration in 1989 had a value of about 10%g. Today we are designing for an earthquake that would produce a peak ground acceleration at the site of about 0.6g, or six times more powerful, and a worst case magnitude 8.0, similar to 1906. Under this scenario, the entire northern length of the San Andreas Fault ruptures from Hollister to Cape Mendocino. This is roughly a 1,000-year event."

The changes made so the tower will withstand a 1906-like quake consisted of strengthening columns that comprise the legs with inch-thick steel cover plates in 1996; additional strengthening of columns, adding bracing, and modifying many connections for higher capacity in 2003, and additional strengthening in 2007.



Brandon Carleton pointed out the seismic bracing that was added in KGO-TV's control room

At the same time, the TV stations themselves have completed seismic upgrades of their areas at Sutro Tower. Most have added supports and bracing for all of the equipment in their control rooms, and installed new generators to ensure they continue broadcasting during a blackout.

Brandon Carleton, vice president of technology at KGO-TV, noted that the antennas at Sutro Tower are "the main distribution point to get the signal out", even with a network backup in Atlanta. "As long as the power stays on, we're fine," he said, "and our generators have multiple days of fuel."

"We make sure that we have redundancies across the board both at our studios and at Sutro," said Jeff Jeff Jeandheur, director of broadcast operations and engineering for KPIX. "Lots of consideration is given to insure we have a primary and a backup and another backup. We put in seriously oversized generators!"

KPIX tests its earthquake preparedness once a quarter and performs regular maintenance and upgrades. Next up: "We're adding remote monitoring and control of our generators so we can be able to remotely fire them up if they didn't start on their own," Jeandheur said.