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Mission Bay Developers Take on Quake Challenges, Buildings, Parks Need Expensive Extra Work, San Francisco Business Times, Steve Ginsberg

The build-out of Mission Bay posed the question: What type of construction will hold up there should a magnitude 7.0 quake hit the region? Mission Bay, which was once actually a bay, contains some of the least stable soil in San Francisco.

“The biggest problem at Mission Bay is that the ground is bay mud. It’s like building on a bed of Jell-O. You need to drive pre-cast piles,” said engineer Kurt Lindorfer, a principal at Paradigm Structural Engineers who has worked in Mission Bay on Alexandria’s biotech buildings. “From a proximity stand point, Mission Bay is a lot farther from a fault line than many other places. It’s farther from the San Andreas and Hayward fault lines, seismically speaking, but because of its soil, it presents a series of problems.”

When landfill settles, there are often myriad maintenance issues a landlord must face in an earthquake’s aftermath. Much of Loma Prieta’s damage was caused by the settling and liquefaction of sand, engineers and seismologists acknowledge. But Loma Prieta’s lessons were not the most valuable, according to Lindorfer.

“The lessons we learned from the (1994) Northridge earthquake were really more important than the lessons we learned from Loma Prieta, as it pertains to Mission Bay. Before Northridge, we thought we were in good shape with the kinds of buildings we had. Since then, construction techniques have become more stringent.”

(articles enclosed)



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Mission Bay developers take on quake challenges

Buildings, parks need expensive extra work

BY STEVE GINSBERG
San Francisco Business Times Contributor

When the Loma Prieta earthquake shook the Bay Area in 1989, the Bay Bridge and Nimitz Freeway buckled, and the Marina District was set ablaze. In San Francisco's sparsely occupied Mission Bay, the ground wobbled, the dust stirred, and life went on.

But in the late 1990s, construction cranes showed up en masse in Mission Bay. Now, nearly 20 years after Loma Prieta, there is a new city at Mission Bay.

Back in 1989, Mission Bay was not seismically challenged. It was dominated by a golf driving range, low-slung industrial warehouses and storage yards.

Today, several million square feet of residential and office buildings have gone up, as well as a 45,000-seat baseball stadium. The University of California, San Francisco, is building a new medical campus there — over \$1 billion has already been spent on that project.

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of the least stable soil in San Francisco. (In his 1840 classic "Two Years Before the Mast," author Richard Henry Dana describes how his ship anchored south of Rincon Hill in the area of what today is the Mission Bay neighborhood.)

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Those problems present developers with added construction costs. To design and construct a new building in Mission Bay costs at least 3 percent to 5 percent more than elsewhere in the city due to structural costs alone. Liquefaction issues also confront builders.

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Luck of the piles

Mission Bay's soil strata is far from uniform, and some buildings are easier to stabilize than others close by. That matters because pilings need to be sunk to bedrock.

"Some sites are better than others. With our Berry Street project, 50 percent of the piles we had to drive went 80 feet deep, and 50 percent were 150 feet deep. We got lucky on 50 percent of the site," said Dan Deibel, Urban Housing Group's development director. "On our 555 Mission Rock project, all the piles were 225 feet deep. Some developers have no piles at all."

Urban Housing is a national market-rate apartment developer and its two buildings typify the challenges some developers face at Mission Bay. On its Mission Rock highrise, which will be complete in February, it had to drive 400 steel piles to compensate for uniform soil. The steel piles are 50 percent more costly than concrete piles, but those were not an option at Mission Bay. Once concrete piles hit bedrock, they can't be driven through. Steel can penetrate bedrock to stabilize the building.

On the \$62 million building, 8 percent of the cost was for seismic considerations. In addition to the piles, Urban Housing had to compress the soil on the 1½-acre site by bouncing 3-foot-by-3-foot plates on the site to remove the liquefaction risk.

Cost benefit

Despite the added cost, Mission Bay is worth it. "Rent is driven by market considerations, not by construction costs," Deibel said. "But there are other



Building sites differ in Mission Bay, says Deibel. Some require pilings driven 80 feet to bedrock, some 150 feet.

benefits in building in Mission Bay. There are separate affordability quotas there, and we can build 100 percent market rate on our site. Elsewhere in the city, there is a 12 to 15 percent requirement for affordable units."

Urban is using Treadwell & Rolfo to do its seismic work, and structural engineer Sunil Gupta of OLMM has also worked on the project.

UCSF's sprawling campus has also required a variety of piles. The first major campus building, Genentech Hall, required only 40-foot piles. The most recent construction on Block II, where a variety of labs and community buildings were erected, piles had to be driven 120 to 140 feet, according to Michael Biele, the UCSF Mission Bay campus architect.

In some buildings at UCSF, the city's building code standards were exceeded to protect the school's scientific assets as well as its personnel. Even the campus' large open space areas required mitigation — a nine-month project to compress the soil and remove water to prevent liquefaction. That so-called "surcharging" work in the open space amounted to 2 percent of the overall construction cost, or around \$2 million.

"Surcharging the land comes at a premium cost, and a lot of streets and open spaces in San Francisco don't have it done," Biele said. "By doing it, we get peace of mind and a place of refuge."

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