



OFFICE OF THE CITY ADMINISTRATOR



Edwin M. Lee, Mayor
Naomi M. Kelly, City Administrator

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*****PRESS RELEASE*****

CITY RECEIVES STRUCTURAL AND SEISMIC SAFETY REPORT ON 301 MISSION STREET

San Francisco, CA – An independent engineering report on the structural and seismic safety of Millennium Tower, located at 301 Mission Street, found that the building is safe at this time in the event of a major earthquake.

A new study for the engineering report, titled Structural Safety Review of the Millennium Tower, was conducted at the request of Mayor Edwin M. Lee and executed through the office of City Administrator Naomi M. Kelly. The analyses were completed by technical experts Gregory Deierlein, Ph.D., Marko Schotanus, SE, Ph.D., and Craig Shields, PE, GE. A final summary of their findings was presented to the City's 301 Mission Street Seismic Safety Study Committee, a specially assembled panel of City officials.

“We are pleased to release a report that independently confirms Millennium Tower is safe for the time being in the event of a major earthquake,” said City Administrator Naomi Kelly. “As recommended by the independent engineering experts, the City will continue to closely monitor the building.”

Deierlein, Schotanus and Shields were selected by the 301 Mission Street Seismic Safety Study Committee in November 2016 to serve as the Expert Engineering Panel and determine Millennium Tower's ability to meet modern structural and safety standards of the San Francisco Building Code. Their analysis is based on review of the building's structural and foundation systems and considers the effects of the building's significant settlement and tilt on its safety against strong ground shaking.

Conclusions for the report were drawn from a review of building design documents, survey information, inspection reports and results from computer modelling led by engineering firm Simpson Gumpertz and Heger (SGH) to simulate severe ground motion. SGH was separately hired by developers Millennium Partners to investigate the building's earthquake safety. SGH's analysis was led by structural engineer Ronald O. Hamburger and presented in three reports (2014, 2016, 2017).

The 2017 SGH report, finalized on July 26, includes comments and questions submitted by the Expert Engineering Panel that also requested additional settings be run through the computer analysis. These adjustments included: a level of maximum ground shaking consistent with the current building code; modeling for the building's settlement and tilt; modeling and checking

of the forces in the pile foundations; modeling of the outrigger beams; and the impact of a large earthquake's deformation demands on the outrigger beams. In addition, the latest set of analyses includes results to help assess the building's overall response relative to building standards that would be acceptable for tall buildings designed to current code requirements. Prior studies focused on changes as a result of the settlement.

"This process shows that a thorough examination was given to the current conditions at Millennium Tower and that consideration was given to our ever-evolving building standards meant to make our City safer," said Kelly.

Millennium Tower was constructed under 2001 building codes and was completed in 2009. It has settled 17 inches, and the top of the tower is measured as leaning 14 inches to the west and 6 inches to the north.

About the 301 Mission Seismic Safety Study Committee

The 301 Mission Street Seismic Safety Study Committee is working with City departments and outside consultants like the Expert Engineering Panel to monitor the building's safety. Members of the group include City Administrator Naomi Kelly, Department of Building Inspection Director Tom Hui, Executive Director of the Department of Emergency Management Anne Kronenberg, and San Francisco Public Utilities Commission Assistant General Manager of Infrastructure Kathy How.

About the Expert Engineering Panel

Gregory Deierlein, Ph.D. is a professor of civil engineering at Stanford University, where he has served as director of John A. Blume Earthquake Engineering Center since 2002. His research focuses on performance-based seismic design buildings, using nonlinear structural analysis, seismic hazard characterization, and damage and loss modeling. Recent research projects include development of strength and stiffness degrading models to simulate steel and reinforced concrete structures, assessment of the seismic performance and collapse safety of buildings, and computational modeling of earthquake-induced fracture in steel structures. He is active on national technical and professional committees, and he has been engaged on structural design review committees for buildings in San Francisco, Los Angeles, and San Diego. His research and professional contributions have been recognized in several awards, including his election to the National Academy of Engineering in 2013. Deierlein holds a PhD from the University of Texas, Austin, a master's from the University of California, Berkeley, and a bachelor's from Cornell.

Marko Schotanus, SE, Ph.D., is a senior associate of Rutherford + Chekene. He has peer reviewed high-rise concrete wall structure projects in San Francisco, Seattle, and Sacramento and has provided performance-based seismic evaluations of dozens of existing buildings. Schotanus is a member of the American Society of Civil Engineers (ASCE) and its committee which develops the ASCE-41 standard for Seismic Evaluation and Retrofit of Existing Buildings. He also serves on the Existing Buildings Subcommittee of the National Council of Structural Engineering Associations, which is a lead developer of the International Existing Building Code. Schotanus is a registered civil and structural engineer in California and holds a PhD from the University of Pavia, a master's from the European School for Advanced Studies in Reduction of Seismic Risk, and a master's from Delft University of Technology.

Craig Shields, GE, is principal engineer at Rockridge Geotechnical. He has more than 34 years of experience in providing geotechnical design, construction review, and project management for private and public projects. Shields has worked on mid-rise and high-rise buildings, and his

experience includes directing explorations of soil, rock, and groundwater conditions, design and evaluation of foundation systems. He is a registered civil engineer and geotechnical engineer in California. He holds a bachelor's degree and a master's degree in civil engineering, both from the University of California, Berkeley.

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