

**Department of Structural Engineering
University of California, San Diego
SE 290 Seminar**



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Principal, Director of Seismic Design
Walter P. Moore and Associates, Inc.

"San Francisco International Airport Air Traffic Control Tower"

Wednesday, April 19, 2017

1:00 pm - 1:50 pm, Pepper Canyon Hall, Room 122

<http://structures.ucsd.edu/node/2126>

Abstract

The new San Francisco International Airport features a 220 foot tall air-traffic control tower surrounded by an integrated three-story, FAA office building. The tower's iconic torch-like architectural design has become the symbol of the airport.

The structural system of the tower is a vertically post-tensioned, cast-in-place cylindrical concrete core. The flared upper structure and control cab is steel framed, cantilevering up and out from the core. The base building has concrete walls and steel gravity framing. The vertically post-tensioned, back-stayed structure tower provides an economical solution to limit deformation and provide operational seismic performance. The design demonstrates the feasibility of constructing damage-resistant, self-centering structural systems economically and efficiently.

A performance-based methodology was adopted for design as the tower height exceeds the code-prescribed height limits for concrete shear wall buildings located in active seismic regions. Located 2.5 miles from the San Andreas Fault, the control tower is designed to withstand the Maximum Considered Earthquake level with safe exiting and to remain operational for the Design Earthquake level. A suite of hazard-specific ground motions were selected and scaled to account for numerous factors, including soil nonlinearity and pile effects on soil response. A tuned-mass damping system was adopted to mitigate accelerations due to wind.

The project is the winner of multiple awards, including the 2016 ACEC Grand Conceptor Award and the 2016 NCSEA Excellence in Structural Engineering Outstanding Project Award.

Biography

Rafael is a Principal and Director of Seismic Design at Walter P Moore. Rafael has earned a Special Achievement Award from AISC, as well as the T.R. Higgins Lectureship award. He is active in the development of seismic design standards for steel systems and is a member of the AISC Seismic Provisions Committee, the ASCE 7 Seismic Task Committee, and the NIST Building Seismic Safety Council's Provisions Update Committee. Rafael is the chair of the AISC Seismic Design Manual committee and was the Project manager for the 5-volume SEAOC *Seismic Design Manual*. Rafael is co-author of *Ductile Design of Steel Structures*, and has written extensively on and behavior of steel seismic systems.

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*Sponsored by Professor Kenneth Loh
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