



Exponent[®]
Engineering & Scientific Consulting

Joaquin Marquez, Ph.D.

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Professional Profile

Dr. Marquez specializes in the evaluation of buildings and other structures considering the effects of extreme loading such as earthquake and impact. He has investigated the performance of existing structures, including evaluation of the root cause of existing damage to concrete, steel, masonry and wood structures, and he has proposed retrofit design solutions to address strength and serviceability issues.

Dr. Marquez has experience with various state-of-the-art software to conduct analyses ranging from modeling simple connections to using finite element methods to conduct in-depth analysis as part of damage or failure assessments. He has designed and detailed a variety of structural systems ranging from concrete slabs, concrete shear walls, coupling beams, steel braced frames; seismic protective systems (i.e. viscous dampers, seismic isolators) and foundations (e.g., spread footings, and micropiles).

Prior to joining Exponent, Dr. Marquez was a senior engineer at Saiful Bouquet Engineers where he worked on various projects involving reinforced concrete and steel design for various building design types (e.g., airports, offices, and retrofits). Dr. Marquez was also an instructor and researcher at the University of California, San Diego, where he developed a robust numerical model capable of capturing the nonlinear behavior of seismic protective devices under extreme loading and studied the implications of this behavior on building performance.

Academic Credentials & Professional Honors

Ph.D., Structural Engineering, University of California, San Diego, 2021

M.S., Structural Engineering, University of California, San Diego, 2017

B.S., Civil and Environmental Engineering, University of California, Irvine, 2015

National Science Foundation Graduate Research Fellowship, 2017-2020

San Diego Fellowship, 2015

Academic Appointments

Lecturer, Structural Engineering, University of California, San Diego, 2020-2021

Prior Experience

Senior Engineer, Saiful Bouquet Engineers, 2021-2022

Civil Engineer, Sukut Construction Inc, 2015

Professional Affiliations

American Society of Civil Engineers (ASCE), member

Earthquake Engineering Research Institute (EERI), member

Languages

Spanish

Publications

Marquez, J.F., Mosqueda, G., & Kim, M.K. "Modeling of Lead Rubber Bearings Under Large Cyclic Material Strains." ASCE Journal of Structural Engineering 2021; 49 (12): 1197-1215.

Sarebanha, A., Marquez, J., Hughes, P., & Mosqueda, G. Considerations for modeling of base isolated nuclear power plants subjected to beyond design basis shaking. Nuclear Engineering and Design 2021; 379, 111236.

An, G., Kim, M., Jung, J.-W., Mosqueda, G., and Marquez, J. F. "Evaluation of Clearance to Stop Requirements in A Seismically Isolated Nuclear Power Plant." Energies 2020; 13(22), 6156.

Conference Papers

Marquez, J.F., Mosqueda, G. "Advance Modeling of Lead Rubber Bearings Under High Strains with Experimental Verification" 17th World Conference on Earthquake Engineering 2020; Sendai, Japan.

Mosqueda, G., Marquez, J. F., and J. Hughes, P. "Modeling of Base Isolated Nuclear Power Plant Subjected to Beyond Design Basis Shaking." Transactions 2019; 25th International Conference on Structural Mechanics in Reactor Technology (SMiRT-25).

Marquez, J. F., and Mosqueda, G. "Response of a Seismically Isolated Structure with Lead Rubber Bearings Considering Heating Effects." Proceedings of the 11th National Conference in Earthquake Engineering 2018; Earthquake Engineering Research Institute, Los Angeles, California

Presentations

Marquez, J.F., Mosqueda, G. (2020). "Advance Modeling of Lead Rubber Bearings Under High Strains with Experimental Verification" 17th World Conference on Earthquake Engineering, Sendai, Japan.

Marquez, J. F., and Mosqueda, G. (2018). "Response of a Seismically Isolated Structure with Lead Rubber Bearings Considering Heating Effects." Proceedings of the 11th National Conference in Earthquake Engineering, Earthquake Engineering Research Institute, Los Angeles, California

Project Experience

Los Angeles 1916 Pharmacy building was assessed to be retrofitted using ASCE 41-17. Conducted a tier 1-2 assessment in order to evaluate the necessary retrofits that had to be provided for the unreinforced masonry with concrete framing system.

International airport was assessed for foundation retrofits due to extension of airport. The analysis was conducted considering previously used materials in the RC and extending to ensure adequate design.