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Summary

Keri Ryan is an Associate Professor of Civil Engineering and a member of the Center for Civil Engineering Earthquake Research at the University of Nevada, Reno. She specializes in earthquake engineering and protective systems for high seismic performance, with application to buildings and bridges. She was the PI of the NSF funded Tools for Isolation and Protective Systems (TIPS) project to address impediments to the wider application of seismic isolation systems, and she led an international collaborative test program between the U.S. and Japan that conducted earthquake testing of a full scale building comparing conventional and alternative construction approaches. Ongoing research examines ways to ensure that high performance objectives can be met. She has authored more than 50 publications on topics related to seismic isolation, high seismic performance, nonstructural components, and life cycle analysis of structures.

Professional Preparation

University of California, Berkeley, CA
Ph.D. in Structural Engineering, Mechanics and Materials **2004**
M.S. in Structural Engineering, Mechanics and Materials **1999**

California Institute of Technology, Pasadena, CA
B.S. in Engineering and Applied Science **1998**
Graduated with Honors

Appointments

University of Nevada, Reno, NV
Associate Professor **2013-Present**
Assistant Professor **2010-2013**
Department of Civil and Environmental Engineering

Utah State University, Logan, UT
Assistant Professor - Structures Division **2004 -2010**
Department of Civil and Environmental Engineering

Funded Projects Relevant to Seismic Performance of Nonstructural Systems

- National Science Foundation, "Collaborative Research: A Resilience-based Seismic Design Methodology for Tall Wood Buildings", 09/01/2016-08/31/2020, Principal Investigator, $180,000. *Note: My role in this project is to lead the investigation on nonstructural components, and their integration with rocking timber wall systems to achieve seismic resilience.*
- "Full Scale Seismic Isolation Test Program at E-Defense: Collaboration of NEES TIPS/NEES Nonstructural/NIED", August 2011, Principal Investigator. *This test program received U.S. side funding from 3 different projects and about $1 million in industry contributions from 8 different companies. An integrated system of ceilings/partition walls/sprinkler piping was designed and tested as part of the full scale structure.*
- National Science Foundation, "NEESR-GC: Simulation of the Seismic Performance of Nonstructural Systems, Supplement for E-Defense Tests", Supplement awarded February 2011, Unofficial Co-Principal Investigator, $210,000.

Publications Relevant to Seismic Performance of Nonstructural Systems

- Guzman Pujols, J. C., **Ryan, K. L.** (2015). "Development of generalized fragility functions for seismic induced content disruption", *Earthquake Spectra*, EERI, 32(3):1303-1324, August 2016. **doi:** http://dx.doi.org/10.1193/081814EQS130M
- **Ryan, K. L.,** Soroushian, S., Maragakis, E. M., Sato, E., Sasaki, T., Okazaki, T. (2015). "Seismic simulation of an integrated ceiling-partition wall-piping system at E-Defense I: Three-dimensional structural response and base isolation", *Journal of Structural Engineering*, ASCE, 142(2): February 2016. **doi**: http://dx.doi.org/10.1061/(ASCE)ST.1943-541X.0001384, 0401530.
- Soroushian, S., Maragakis, E. M., **Ryan, K. L.**, Sato, E., Sasaki, T., Okazaki, T., Mosqueda, G. (2015). "Seismic simulation of an integrated ceiling-partition wall-piping system at E-Defense. II: Evaluation of nonstructural damage and fragilities", *Journal of Structural Engineering*, ASCE, 142(2), February 2016. **doi**: http://dx.doi.org/10.1061/(ASCE)ST.1943-541X.0001385, 0401531.
- Guzman, J and **Ryan, K. L.** (2015), "Data from a NEES/E-Defense collaborative test program on innovative isolation systems and nonstructural components," *Earthquake Spectra*, EERI, 31(2):1195-1209**.**
- Guzman, J. C., **Ryan, K. L.** (2014). "Experimental Study of Target Demands to Minimize Seismic Induced Content Disruption", *Proc., 10th U.S. National Conference on Earthquake Engineering*, Earthquake Engineering Research Institute, Anchorage, AK, July 2014. Peer Reviewed.
- Guzman Pujols, J. C., **Ryan, K. L.** (2013). Development of Generalized Fragility Functions for Seismic Induced Content Disruption. CCEER Report No. 13-19. Center for Civil Engineering Earthquake Research, University of Nevada, Reno, http://www.unr.edu/cceer/publications/2013/13-19
- **Ryan, K. L.**, E. Sato, T. Sasaki, T. Okazaki, J. Guzman, N. Dao, S. Soroushian, C. Coria (2013). *Full Scale 5-story Building in Fixed-Base Condition at E-Defense*. Network for Earthquake Engineering Simulation Database, DOI:10.4231/D3NP1WJ3P.
- **Ryan, K. L.**, E. Sato, T. Sasaki, T. Okazaki, J. Guzman, N. Dao, S. Soroushian, C. Coria (2013). *Full Scale 5-story Building with LRB/CLB Isolation System at E-Defense*. Network for Earthquake Engineering Simulation Database, DOI:10.4231/D3SB3WZ43.
- **Ryan, K. L.**, E. Sato, T. Sasaki, T. Okazaki, J. Guzman, N. Dao, S. Soroushian, C. Coria (2013). *Full Scale 5-story Building with Triple Pendulum Bearings at E-Defense*. Network for Earthquake Engineering Simulation Database, DOI:10.4231/D3X34MR7R.
- Soroushian, S., K. L. Ryan, E. Maragakis, J. Wieser, T. Sasaki, E. Sato, T. Okazaki, L. Tedesco, A. E. Zaghi, G. Mosqueda, D. Alvarez (2012), "NEES/E-Defense Tests: Seismic performance of Ceiling/Sprinkler/Piping Nonstructural Systems in Base-Isolated and Fixed-Base Building", *Proc., 15th World Conference on Earthquake Engineering*, Portuguese Society for Earthquake Engineering, Lisbon, Portugal, September 2012
- Soroushian, S., Ryan, K. L., Maragakis, M., Sasaki, T., Sato, E., Okazaki, T., Tedesco, L., Zaghi, A. E., Mosqueda, G., Alvarez, D. (2012). "Seismic response of ceiling/sprinkler piping nonstructural systems in NEES TIPS/NEES Nonstructural/NIED collaborative tests on a full scale 5-story building", Proceedings of 2012 ASCE Structures Congress, Chicago, IL, March, 2012.

Professional Service Relevant to Seismic Performance of Nonstructural Systems

- Served on Peer Review Panel (PRP) for ATC-120: Seismic Analysis and Design of Nonstructural Components and Systems, First Phase (January 2015 – June 2016). This project aims to improve technical aspects of nonstructural system design in areas of largest impact on public safety and economic welfare, by identifying and resolving inconsistencies between current design requirements and observed or expected performance of nonstructural building systems.
- Organized the NEES TIPS Wrap-Up Workshop, Sept. 18, 2013. This workshop held at the conclusion of the NEES TIPS project to communicate outcomes to practicing professionals focused in part on the seismic performance of nonstructural components in the large scale isolation test.