

Omid Khandel, PhD, PE

Forensic Engineering Expertise

Structural Analysis/Design

Review appropriate documents, including project plans and specifications as it relates to the building structure for purposes of failure analysis and extent of resulting damages. In addition, being a licensed professional and structural engineer, replacement designs are provided upon request. Examples of past work includes failure analysis of collapsed structures and various building components (windows, doors, glass, roofing, exterior and interior cladding) as well as damage assessment of building structures after a fire, tornado, vehicle impact, or tree impact.

Origin & Cause

Determine the source and responsible party or element related to the failure of a structural or architectural element, or water damage in a building. Examples of past work include failure of roofing and wall cladding causing moisture entry as well as humidity and condensation related losses.

Building Fenestration/Building Envelope

The building envelope is a building's first line of defense to moisture entry. Identifying the type of system (single versus multiple barrier) and how the various adjoining materials' water and air barriers connect is key to effective moisture management. Examples of past work include, residential window installations, exterior cladding specification and installation and roofing materials and installation.

Construction Accidents

Determination of circumstances resulting in an accident. In-depth knowledge of the construction contracting process and the building codes is often the deciding factor in determination of cause and responsibility. Examples of past work include collapse of structures while under construction.

Inspection and Evaluation of Roofing Systems

This includes low and steep slope roofs as well as various types of roofing materials, including both common and unique roofing applications. Past work involved offering opinions and repairs related to installation deficiencies and storm-related damages including for hail and wind.

Education

Ph.D. in Civil Engineering
Oklahoma State University, Stillwater, OK
December 2020

Master of Science in Civil Engineering
The University of Toledo, Toledo, OH
August 2016

Bachelor of Science in Civil Engineering
Razi University, Kermanshah, Iran
February 2014

Educational Presentations

- "Deep Learning Based Framework for Long-term Management of Bridges Considering Climate Change Effects," 2019 IABSE Congress, New York City, NY, USA, September 2019
- "An Integrated Framework for Seismic Risk Assessment of Reinforced Concrete Buildings Based on Structural Health Monitoring," 2019 IABSE Congress, New York City, NY, USA, September 2019
- "Application of Fiber Optic Sensors for Damage Detection and Performance Monitoring of Prestressed Concrete Bridge Girders," SHMII-9 - 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure. St. Louis, MO, USA, August 2019
- "Multi-Hazard Risk Assessment of Bridges Considering Climate Change," SPTC Summer Symposium, Oklahoma City, OK, August 2018
- "Multi-hazard Risk Analysis of Bridges Considering Climate Change," 2018 Tran-SET Conference. New Orleans, LA, April 2018
- "Effect of Climate Change on the Risk of Bridge Failure due to Flood and Flood-induced Scour," Structures Congress 2017 (ASCE-SEI 2017), Denver, CO, April 2017

Licenses & Certifications

PE - Professional Engineer
 Licensed by the State of Texas - Number 151104

Employment History

Forensic Engineer
 Nederveld, Grand Rapids, MI
 September 2022 - Present
 Duties include forensic engineering analysis relating to building pathology, structural damage from vehicle impacts, storm damage (wind and hail), and water loss events, calculations, and plan of repair design.

Senior Structural Engineer
 RapidsBuilt Inc., Weatherford, TX
 November 2021-September 2022
 Designing large span steel structures and portal frames with up to 250ft clear span in high wind (e.g., Florida), high snow (e.g., Idaho), and seismic (e.g., California) areas. Designing residential, industrial, aviation, and commercial steel buildings. Highly familiarized with building Codes ASCE/SEI 7, AISC, and IBC. Designing and manufacturing light gauge cold form structures using Framacad software and machine. Run structural analysis using SAP2000 and Autodesk Robot. Participating in meetings with clients and management and providing inputs. Reviewing construction submittals and shop drawings.

Postdoctoral Researcher & Graduate Assistant
 Oklahoma State University, Stillwater, OK
 August 2016-November 2021
 Conducting research and writing technical papers and reports on: Understanding the behavior of steel connections made in combination of bolts and welds (AISC funded project), application of fiber optic sensors for monitoring prestressed concrete bridges (SPTC funded project), enabling data interoperability for NSF archives of high-rate real-time GPS and seismic observations of induced earthquakes and structural damage detection in OK (NSF funded project), prediction of fatigue crack propagation under random sea loading through coupled experimental and numerical analysis (ONR funded project), sustainability-based long-term management of bridges under multi-hazards exposure (Tran-SET funded

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project), risk-based life-cycle management of deteriorating bridges (SPTC funded project).

Graduate Assistant

January 2015-May 2016

The University of Toledo

Conducting research on: Improving the Response of Steel Structures Subjected to Blast Loading

Publications

Journal Publications

- Rostami, J., Sahneh, A. R., Sedighardekani, R., Latifinowsoud, M., Rostami, R., Kaltaei, A., ... & Khandel, O. "Influence of phase change material and nano silica aerogel aggregates on the characteristics of cementitious composite: An experimental and predictive study." *Journal of Building Engineering*, 2023
- Tamimi, M. F., Soliman, M., & Khandel, O. "A comprehensive approach for quantifying the reliability of ship hulls under propagating fatigue cracks." *Ocean Engineering*, 2023
- Khandel, O., Tamimi, M. F., Soliman, M., Russell, B. W., & Waite, C. D., "Reliability Assessment of Connections with Slip-Critical Bolts and Fillet Welds in Combination", *Journal of Constructional Steel Research*, 2022
- Tamimi, Mohammad F., Omid Khandel, and Mohamed Soliman. "A framework for Quantifying Fatigue Deterioration of Ship Structures under Changing Climate Conditions." *Ships and Offshore Structures*, 2022
- Khandel, O., & Soliman, M., "Performance Assessment of Prestressed Concrete Bridge Girders Using Fiber Optic Sensors and Artificial Neural Networks", *Journal of Structures and Infrastructure Engineering*, 2021
- Khandel, Omid, and Mohamed Soliman. "Integrated Framework for Assessment of Time-variant Flood Fragility of Bridges using Deep Learning Neural Networks." *Journal of Infrastructure Systems*, 2021
- Sheikh, I. A., Khandel, O., Soliman, M., Haase, J. S., & Jaiswal, P., "Seismic Fragility Analysis Using Nonlinear Autoregressive Neural Networks with Exogenous Input", *Journal of Structures and Infrastructure Engineering*, 2021
- Rostami, Jamshid, Omid Khandel, Reza Sedighardekani, Alireza Rasekhi Sahneh, and SeyedAli Ghahari. "Enhanced Workability, Durability, and Thermal Properties of Cement-based Composites with Aerogel and Paraffin Coated Recycled Aggregates." *Journal of Cleaner Production*, 2021
- Khandel, Omid, and Mohamed Soliman. "Integrated Framework for Quantifying the Effect of Climate Change on the Risk of Bridge Failure Due to Floods and Flood-Induced Scour." *Journal of Bridge Engineering*, 2019

Project Reports

- Soliman, M., & Khandel, O., "Sustainability-based Long-Term Management of Bridges under Multi-Hazard Exposure", Project No. 17STOKS01, 2018
- Soliman, M., Khandel, O., & Hartell, J. A., "Risk-based Life-Cycle Management of Deteriorating Bridges", Report No. SPTC15.1-12-F, 2018

Conference Publications

- Khandel, O. & Soliman, M., "Deep Learning Based Framework for Long-term Management of Bridges Considering Climate Change Effects," 2019 IABSE Congress, New York City, NY, USA, September 4-6, 2019
- Sheikh, I. A., Khandel, O., Soliman, M., Hasse, J. S., & Jaiswal, P., "An Integrated Framework for Seismic Risk Assessment of Reinforced Concrete Buildings Based on Structural Health Monitoring," 2019 IABSE Congress, 2019

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- Khandel, O., Soliman, M., Floyd, R., & Murray, C. D., "Application of Fiber Optic Sensors for Damage Detection and Performance Monitoring of Prestressed Concrete Bridge Girders", SHMII-9 – 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure, 2019
- Abuela, H., Khandel, O., Soliman, M., & Ekin, S., "An Innovative Implementation of Visible Light Sensing for Quantifying the Dynamic Response of Bridge Girders", SHMII-9 – 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure, 2019
- Khandel, O. & Soliman, M., "A multi-hazard Probabilistic Framework for Quantifying Bridge Failure Risk Considering Climate Change" 2019 Tran-SET Conference, 2019
- Khandel, O. & Soliman, M., "Maintenance Optimization for Deteriorating Bridges under Uncertainty", ASCE-SEI 2018 Structures Congress, 2018
- Khandel, O. & Soliman, M., "Multi-hazard Risk Analysis of Bridges Considering Climate Change," 2018 Tran-SET Conference, 2018
- Parvin, A., Khandel, & O. Crozier, D., "Progressive Collapse Analysis of Concrete Frame Structures," SMAR 2017 - Proceeding of 4th International Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures, 2017
- Soliman, M. & Khandel, O., "Management of Fatigue Sensitive Structures under Uncertainty," ICOSSAR 2017 - Proceeding of 12th International Conference on Structural Safety and Reliability, 2017

Expert Witness Experience

Depositions

May 2025

Direct Import Parts, Inc. vs Fremont Insurance Company

Expert Witness for Fremont Insurance Company

Ionia County 8th District Circuit Court, State of Michigan, Case No. 24-S-36440-CK

March 2025

Teresa H. Carrington and David R. Carrington vs State Farm Fire and Casualty Company

Expert Witness for State Farm Fire and Casualty Company

Court of Gwinnett County, State of Georgia, Civil Action No. 24-A-07084-8