

Joshua Trei, 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 engineer, replacement designs are provided upon request. Examples of past work includes failure analysis of collapsed structures and various building components as well as damage assessment of building structures after a fire, vehicle impact, snow overload, tornado, and hurricane.

Origin & Cause

Determine the source and responsible party or element related to water entry into a building whether it be through the building envelope or caused within the building interior. Examples of past work include failure of roofing and wall cladding causing moisture entry, humidity and condensation related losses, and groundwater entry.

Inspection and Evaluation of Roofing Systems

This includes steep and low 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.

Building Pathology/Construction Defects

The building pathologist relies on an in-depth knowledge of building design, construction, use, and changes as well as assessing the environment of use and the materials and how these interrelate to systematically identify, investigate, and diagnose defects in a building.

Qualifications & Training

- IIBEC Building Enclosure Symposium: International Institute of Building Enclosure Consultants, September 2023. Specific training includes:
 - Building the Future: Harnessing the Power of AI in the Building Enclosure Industry
 - Fenestration Replacement: Identifying Design Solutions for Existing Buildings
 - Evaluation of Vapor Retarder in Roof Decks by Hygrothermal Simulation
 - Building Enclosure Commissioning: A Valuable Service to Owners
 - Reviving a Historic Landmark: Assessment and Monitoring of "Detroit's Larger Art Object" the Iconic Fisher Building
 - Façade Inspection Ordinances – History, Techniques, and Case Studies
 - Lessons learned from Building Enclosure Delegated Design Disasters
 - Changes to the Wind Load Provisions and How to Implement Strategies in a Re-Roofing Project Design
 - Making Fenestration Part of Your Overall Energy Management Plan
 - Adhered Masonry Seismic Testing
- Diagnosis, Repair, and Restoration of Building Facades: American Society of Civil Engineers (ASCE), November 2023

- Geo-Structural Investigation of Existing Structures: American Society of Civil Engineers (ASCE), November 2023
- Approaches to Grouting in Karst: American Society of Civil Engineers (ASCE), November 2023
- Mines Subsidence Cause Effect and Mitigation: American Society of Civil Engineers (ASCE), November 2023
- Illinois Structural Engineering Conference: University of Illinois in Urbana-Champaign, IL, February 2021
- G1 Web Conference: Earth Retaining Structures: American Society of Civil Engineers (ASCE), November 2023
- Forensic Engineering Summit: National Academy of Forensic Engineers (NAFE), August 2020
- Wind Design for Low-Slope Roofs - Part 1: Understanding ASCE 7-05 Wind Load Calculations: International Institute of Building Enclosure Consultants (IIBEC), March 2021
- Avoiding Ethical Pitfalls in Failure Investigations: American Society of Civil Engineers (ASCE), March 2020

Education

Bachelor of Science in Civil Engineering
University of Illinois - College of Engineering, Urbana – Champaign
December 2003

Licenses & Certifications

PE – Professional Engineer
Licensed by the State of Illinois – Number 062062244
Licensed by the State of Ohio – Number 90682
Licensed by the State of Missouri – Number PE-2025000097

Employment History

Forensic Engineer
Nederveld, Inc.
2015 - Present
Perform forensic analysis relating to building pathology issues, fire loss damage, structural damage from vehicle impacts, storm damage (wind, snow, hail), and water loss events.

Structural Engineer and Structural/Bridge Inspector
Hampton, Lenzini, & Renwick, Inc.
2011 - 2015
Duties included performing analysis and detailed design of single and multiple span bridge structures, including decks, beams, girders, slabs, bearings, piers, abutments, and foundations. Managed and participated in FHWA and IDOT bridge inspections, including reporting, rating calculations, recommendations and monitoring, performed inspections on various non-bridge structures, including transmission towers, light poles retaining walls, and residential buildings.

Structural Associate II and Field Inspector
Sargent & Lundry LLC
2007 - 2011
Performed structural analysis, detailed design, and preparation of specifications and design drawings for building structures, including primarily steel and concrete design of structural members, connections, foundations, retaining walls, lateral braces, tunnels, pipe supports, and associated pertinences.

Performed Structural Condition Assessment reports based on expertise of structural evaluation, performing calculations based on degradation, and making recommendations for future use. Managed and participated in condition assessments of various structural components of power plants.

Structural Engineer II
Vermont Agency of Transportation
2005 - 2007

Performed analysis and detailed design of single and multiple superstructures, including decks, beams, girders, slabs, trusses, and covered bridges. Performed analysis and detailed design of substructure, including spread footings, drilled shafts, drilled piers, and H-piles.

Structural Engineer I
Bridge Inspection & Management
2005 - 2007

Duties included field inspection of bridges and drafting temporary and permanent bridges related to reconstructions projects, including reporting, rating calculations, and overload permit reviews.

LRFD Implementation Committee Member
LRFD Implementation Committee
2005 - 2007

Aided in the adaption of LRFD in the new VT State Structures Manual, compared the differences in the codes and modified standards, and calculations to fit the new requirements.

Resident Technician
Carroll Engineering & Associates
2004 - 2005

Duties included assisting with the design and inspection of highway reconstructions projects, drainage projects, and bridge projects. Clients included IDOT, local jurisdictions, and private companies.

Expert Witness Experience

Deposition

November 2022

Christopher Saul and Ryann Saul vs Erie Insurance Company and Auto Club Family Insurance (a/k/a AAA Insurance)
Expert Witness for Erie Insurance
Circuit Court Third Judicial Circuit Madison County, Illinois, Case No. 2019L001850

April 2019

North Shore Co-Owners Association, Inc. vs Nationwide Mutual Insurance Company
Expert Witness for Nationwide Mutual Insurance Company
United States District Court, Case No. 1:18-cv-03632-SEB-TAB

February 2018

Byron Siebert and Jennifer Siebert vs Arnold Masonry, LLC

Expert Witness for Arnold Masonry, LLC on behalf of Baylard, Billington,
Dempsey & Jensen, PC

Ste. Genevieve Circuit, Case No. 16SG-CC00198

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