

Jacob Choate, PhD

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. Examples of past work includes failure analysis of collapsed structures (concrete, steel, wood, masonry), and various building components (windows, doors, glass, piping, roofing, exterior and interior cladding).

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, 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 storefront window exams, residential window installations, exterior cladding specification and installation and roofing materials and installation.

Inspection and Evaluation of Roofing Systems

This includes steep and low slopes 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

Doctor of Philosophy in Civil Engineering
University of Oklahoma, Norman, OK
December 2023

Master of Science in Civil Engineering
University of Oklahoma, Norman, OK
August 2018

Bachelor of Science in Architectural Engineering
University of Oklahoma, Norman, OK
May 2015

Educational Presentations

Choate, J. and Volz, J., "Hybrid Ultra-High-Performance Concrete/Conventional Concrete Prestressed Girders,"
ACI Fall 2022 Convention, Dallas, TX, October 23-26, 2022

Choate, J., "Optimization of Composite Concrete Members Using UHPC,"
2023 Structures Congress, New Orleans, LA, May 3-6, 2023

Choate, J. and Volz, J., "Implementing Fiber-Reinforced, Self-Consolidating Concrete as a Repair Material for AASHTO Prestressed Concrete Girders,"
Oklahoma Transportation Research Day, Oklahoma, OK, October 23, 2018

Employment History

Forensic Engineer
Nederveld, Inc.

2024 – Present

Duties include forensic engineering analysis relating to building pathology, structural damage due to fire, structural damage from vehicle impacts, storm damage (wind, snow, hail), seismic, and water loss events, calculations, and plan of repair design.

Instructor

School of Civil Engineering and Environmental Science, Norman, OK

2021 – 2023

Duties included developing, instructing, and grading Structural Steel Design I course for undergraduate students.

Teaching Assistant

School of Civil Engineering and Environmental Science, Norman, OK

2017 – 2023

Classes included Advanced Mechanics of Materials, Materials, Prestressed Concrete Design, Structural Design Concrete I, Structural Concrete Design II, Structural Steel Design I. Developed 2-D and 3-D instructional graphics, graded assignments/exams, developed pre-lab lectures, demonstrated and supervised laboratory procedures, and reviewed lab reports. Created laboratory videos.

Research Assistant

School of Civil Engineering and Environmental Science, Norman, OK

2015 - 2023

Duties included exploratory demolition of concrete members and repair of failed prestressed concrete girders, evaluation of various concrete properties and interfacial concrete properties.

Professional Affiliations

American Concrete Institute (ACI)
Structural Engineering Institute

Publications

End-Region Evaluation of Hybrid Ultra-High-Performance Concrete/Conventional Concrete Prestressed Girders

University of Oklahoma Dissertation for Doctor of Philosophy
2023

Implementing Fiber-Reinforced, Self-Consolidating Concrete as a Repair Material for AASHTO Prestressed Concrete Girders

University of Oklahoma Thesis for Master of Science Degree
2018