

NEZAR ABRAHAM, S.E., P.E.

Associate Principal



Summary

Nezar Abraham is a licensed structural and professional engineer with over 17 years of management and professional structural engineering experience. He brings years of advanced analysis experience from the nuclear industry to solve complex structural engineering problems. His structural and building envelope experience is focused on forensic investigations, emergency response, protective design, property loss consulting, failure analysis investigation, and rehabilitation of steel, concrete, masonry and timber. He has expertise in structural dynamics, linear and non-linear finite element analysis, and evaluating buildings and structures for various conditions and forms of damage, including: code compliance, construction defects, structural failure analysis, fire damage, and earthquake/hurricane/tornado/damage.

Areas of Technical Expertise

- Forensic Structural Engineering
- Emergency Response
- Structural Engineering

Education

- M.S., Structural Engineering, 2008, Illinois Institute of Technology
- B.S., Structural Engineering, 2006, Illinois Institute of Technology

Registrations

- Registered Structural Engineer in IL
- Registered Professional Engineer in FL, IA, IL, IN, LA, MI, NC, ND, TN, WI and WY

Professional Activities

- Member, American Society of Civil Engineers, Energy Division, Structural Fire Engineering Task Committee
- Continuing Education Committee Member, Structural Engineers Association of Illinois (SEAOI)
- Member, Forensic Engineering Division, Committee on Practices to Reduce Failure, American Society of Civil Engineers (ASCE)
- Member, ACE Chicago Mentor Program
- Member, Forensic Engineering Division, Wild Speed Estimation in Tornadoes Committee, American Society of Civil Engineers (ASCE)

Select Project Experience

Forensic Structural Engineering

Amazon Warehouse Collapse Investigation, Edwardsville, IL. Scope of damage and cause and origin investigation into the partial collapse of an Amazon DLI4 distribution warehouse as a result of an EF-3 tornado.

Confidential Investigation, MI. Immediate shoring of a newly designed and constructed higher education facility with a comprehensive analysis of the building and remediation design.

Willis Tower, Chicago, IL. Forensic investigation into the cause of flooding after a heavy rain event.

IPFW, Indiana Pedestrian Bridge, Fort Wayne, IN. Analysis of a newly constructed pedestrian bridge for brittle fracture concerns over select welded design connection details.

Confidential Project, Louisville, KY. Analysis of a 28-story tower over design concerns.

Refinery Crane Accident, Whiting, IN.* Root cause analysis of failed steel bridge crane at BP Whiting refinery.

Confidential Investigation, Tampa, FL. Man lift boom fracture forensic investigation.

Emergency Response

Confidential Investigation, MI. Immediate shoring of a newly designed and constructed higher education facility with a comprehensive analysis of the building and remediation design.

Confidential Investigation, OH. on site support, investigation, and analysis of building movement under construction of a high rise health care facility with a comprehensive analysis of the building and remediation design.

Confidential Investigation, BC. seismic performance evaluation of an newly constructed 11-story residential building with a comprehensive analysis of the building and remediation design.

*Denotes work performed with previous employer.

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Confidential Parking Garage Assessment, WI. Structural damage assessment of a parking garage, a 9-story commercial tower, and a 5-story residential building following an explosion and a fire in a parking garage.

Property Loss Consulting

Hurricane Ian Damage Assessments, FL. Structural and building envelope damage assessment of multiple 5-10 story condominium buildings following Hurricane Ian.

RadioTalk Forensic Investigation, Joplin, MO. Forensic investigation of reported fractures in a 700-foot radio tower's legs.

Heat Treating Plant Fire Damage Assessment, Cherry Valley, IL.* Investigation of a 70,000-SF heat treating facility to determine the extent of damage due to a fire event.

Post Disaster Evaluations, FL, IA, WI.* Structural evaluations of multiple commercial, agricultural and residential structures in the wake of hurricanes Irma and Michael in Florida, and multiple tornadoes in Wisconsin and Iowa.

Building Damage Assessments, IL, IN, MN.* Evaluations and investigations of residential, commercial and industrial structures for damage due to: fire, high wind, vehicular impact, mine subsidence, and construction defects. Building envelopes assessment for water infiltration.

S&R Egg Farm, WI. Cause and origin investigation of two collapsed roofs in a food processing plant, and a structural condition assessment of multiple other buildings.

Structural Engineering

New Nuclear Power Plant Design, Southern TX.* Structural design of reactor building, control building, radioactive waste building, ultimate heat sink building, and turbine building as part of the Advanced Boiling Water Reactor technology.

New Nuclear Power Plant Design, AP1000, GA, SC and CHN.* Structural design of components within the reactor building containment structure as part of the pressurized water reactor technology.

Ontario Power Generating Nuclear Station, Ontario, CAN.* Design of concrete structures against tornado loadings within the new Darlington Nuclear Generating Station.

Existing Nuclear Power Plant Assessments and Modifications, multiple states.* Linear and non-linear finite element analyses of multiple systems within the plants to demonstrate structural integrity against natural and man-made hazards. Seismic upgrades of several US nuclear power plants after the Fukushima Daiichi nuclear incident in Japan.

Chemistry and Metallurgy Research Replacement Facility, NM.* Design of multiple components within the Los Alamos National Laboratory Department of Energy facility.

SHINE, Medical Radioactive Isotopes Facility, Janesville, WI.* Design of facility against natural and man-made hazards.

CITGO Refinery Plant Foundation Design, Lemont, IL.* Foundation design of static and rotating equipment for a new boiler unit at CITGO plant.

Construction Safety and Administration/OSHA Compliance

4th and Race Construction Consulting, Cincinnati, OH. Construction consulting of a 13-story mixed-use pre-stressed concrete building.

Sworn Testimony

Deposition, Alpha Dev. Group LLC, et al. v. Liberty Mutual Ins. Co., regarding structural failure causation analysis with repair scope recommendation for a reported tornado loss in October 2021. United States District Court Western District of Louisiana, Lake Charles Division, October 20, 2022.

Alternative Dispute Resolution

Eden Owners v. Underwriters, FL. Mediation regarding a hurricane Sally investigation claim of a 28-story tower.

Logan Aluminum, Inc. v. Ace World Co. Ltd., Lexington, KY. Mediation regarding overhead crane design and construction where plaintiff alleged crane did not meet contract specs and defendant requested design changes.

Select Papers, Lectures and Publications

"Fracture-critical Bridge Components Subject to Fatigue Loading," 11th International Conference on Bridge Maintenance, Safety and Management, Barcelona, Spain, July 2022 (co-author)

"Material Deterioration – Fitness-For-Service Analysis and Repair of a Steel Tank," Forensic Engineering 8th Congress, 2018 (co-author)

"Evaluation of a New Forcing Function for Analysis of Structures Due to Automobile Missile Impacts," Geotechnical and Structural Engineering Congress, Phoenix, AZ, 2016 (co-presenter)

"Relative Building Movements for Design of Commodities in Nuclear Plants," SMIRT Conference, Manchester, UK, 2015 (co-author)

CONTACT

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