CHUKWUMA G. EKWUEME, PH.D., PE, SE, LEED AP

Principal

Summary

Dr. Chukwuma Ekwueme joined Thornton Tomasetti in 2001. He has an extensive background in the design and analysis of a wide variety of structures, including concrete and masonry construction, steel and aluminum structures and light-framed wood buildings. Dr. Ekwueme is highly skilled in the analysis and design of earthquake-resisting structures and is particularly adept at improving structural performance by using advanced technology such as base isolation, external dampers, and fiber-reinforced composites. He has provided expert witness services on numerous projects focusing on structural failures, damage investigations, and construction defects. Dr. Ekwueme is also a Lecturer in the Department of Civil Engineering at the University of California Los Angeles, where he teaches courses on reinforced concrete and masonry design.

Areas of Technical Expertise

- Failure Analysis
- Building Design and Seismic Retrofit

Education

- Ph.D., Civil Engineering, Structural Engineering Concentration, 1994, University of California, Los Angeles
- Engineer Degree, 1992, University of California, Los Angeles
- M.S., Civil Engineering, Structural and Earthquake Engineering Concentration, 1990, University of California, Los Angeles
- B.Eng., Civil Engineering, 1987, University of Nigeria

Registrations

- Licensed Professional Engineer in CA
- Licensed Structural Engineer in CA and NV
- LEED Accredited Professional
- Certified DSA Structural Plan Reviewer (2012-present)

Professional Activities

- The Masonry Society (TMS)—Director, Board of Directors (2001-2010); and Voting Member TMS 402/602 Code Committee (2000-present)
- Structural Engineers Association of California (SEAOC)—Board of Directors (2005-2007), SEAOSC; Past Chair, Existing Buildings Committee, SEAOSC; and Past Member, Seismology Committee
- Member, American Society of Civil Engineers (ASCE)
- Member, American Concrete Institute (ACI)
- Lecturer, University of California Los Angeles (2019-present)

Select Project Experience

Failure Analysis

World Trade Center Collapse, New York, NY. Investigation of the cause of the collapse of the twin towers on 9/11. Task group leader—load redistribution analysis.

Harmon Hotel, Las Vegas, NV. Investigation of construction defects in a new 26-story hotel building on the Las Vegas strip.

Starbucks Headquarters, Seattle, WA. Site investigations analysis to identify and document damage to historic buildings after the Nisqually earthquake.

Casino Magic Properties, Biloxi, MI. Investigation of damage to buildings during Hurricane Katrina. This included hotel buildings, parking and casino facilities.

Oquirrh Olympic Oval, Salt Lake City, UT. Investigation of construction phase collapse of a building containing the ice skating oval to be used during the Olympic games.

Royal Palm Hotel, Tumon Bay, Guam. Investigation of earthquake response and cause of damage to two 8-story buildings that partially collapsed during an earthquake.

Northridge Earthquake Damage Investigations, Various Locations, CA. Damage investigations and nonlinear analyses of numerous structures as part of forensic engineering studies after the Northridge Earthquake.

Building Design and Seismic Retrofit

McCarran International Airport Traffic Control Tower, Las Vegas, NV. Structural design and wind-engineering services for a new air traffic control tower that was needed to accommodate a projected increase in air traffic. Services also included blast and progressive collapse analysis for the adjacent Terminal Radar Approach Control building.

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San Diego FBI Field Office Complex, San Diego, CA. Structural, seismic and blast engineering for a 6-story office building of approximately 235,000 square feet; a 30,000-square-foot, 1-story annex; a 6-story, 130,000-square-foot parking facility; and a 90-foot pedestrian bridge that connects the parking structure to the office building.

World Trade Center Transportation Hub, New York, NY. Structural and protective design services for Calatrava's signature World Trade Center Transportation Hub. Services included designing the PATH hall with its oculus roof and the permanent underpinning for and connections to MTA's No. 1 Line.

Institute for Advanced Health, Culver City, CA. Structural engineering for the design of the Los Angeles campus of the Institute for Advanced Health. The project involved the construction of a 27,000-square-foot, 4-story, office building and a retrofit of a 2-story, 58,000-square-foot existing building.

The Park at Bankers Hill, San Diego, CA. Structural engineering for a 14-story tower that contains 60 luxury condominium units, six townhouse units, a common outdoor terrace area, pool and spa.

First Church of Christ, Scientist, Pasadena, CA. Seismic retrofit of a historic reinforced concrete building capped by a 30-foot-high, 60-foot-diameter dome. The 1910 structure presented major earthquake risks after extensive building surveys and analyses were performed. The retrofit consisted of adding shear walls and strengthening slab to wall connections.

University of California, San Diego, Southwest Fisheries Building D, La Jolla, CA. Structural engineering services for the renovation of Building D, now an entity of Scripps Institution of Oceanography, and addition of a new structure. The renovation is comprised of approximately 21,000 square feet and includes the interior and exterior to provide classrooms, offices and research laboratories. The additional structure will provide a lecture room and event space, conference room, lobby and visualization space, catering kitchen and café with roof terrace.

One Santa Fe, Los Angeles, CA. Structural engineering for an award-winning mixed-use development containing 439 residential units over ground-floor retail, live/work space, a plaza, and underground parking, occupying rail yard land leased from Metro.

Home2Suites, Montebello, CA. Structural engineering for a 169,000-square-foot, 8-story, 203-room hotel with one level of parking below grade. The ground floor contains public areas, meeting rooms, a swimming pool and bar.

University of California, Los Angeles, Kerckhoff Hall, Los Angeles, CA. Seismic retrofit for the engineer-of-record, using base isolation for a landmark, non-ductile, concrete building with brick masonry infills. Scope included developing the design criteria and providing computer analyses of the seismic retrofit. Base isolation was installed at the basement level to reduce the building's response from the ground motion and potential damaging forces during an earthquake.

Valley Beth Shalom, Community Center and Entry Pavilion, Los Angeles, CA. Structural engineering for a 12,000-square-foot community center and 5,500-square-foot entry pavilion. The proposed design for the Community Center includes a long-span roof with a three-dimensional space frame and multiple skylights. The center will serve as a gymnasium and meeting place and there will be a sub-level beneath the balcony for storage, bathrooms and other ancillary activities.

Long Beach Unified School District, GTE Middle School, Signal Hill, CA. Structural design for five buildings that are part of a middle school campus located on a 9.8-acre former GTE site.

Santa Monica Fire Station No. 1, Santa Monica, CA. Structural engineering for a 2-story, 57,000-square-foot fire station facility with one level of subterranean parking. The facility includes office space, dormitories, kitchen, fitness area, library, meeting space and storage. The 7,800-square-foot apparatus bay houses maintenance and repair space. Structural features include two mezzanines, skylights and double-height open floor spaces.

Courtyard Marriott, Santa Ana, CA. Structural engineering for a 4-story, 155-room hotel with kitchen meeting rooms, exercise room and exterior pool. The 4-story building consists primarily of wood-framed construction, which was designed to efficiently support gravity and earthquake loads while satisfying intricate programmatic needs.

Sworn Testimony

Deposition, City Center Construction and Lien Master Litigation, regarding the effects of construction defects on a 26-story reinforced concrete building. April 7, 8, 9, 10 and 11, 2014.

Deposition, City Center Construction and Lien Master Litigation, regarding demolition of a 26-story reinforced concrete building due to the presence of construction defects. January 10, 11 and 12, 2012; February 1, 2 and 13, 2012; and June 2012.

Hearing before Trial, City Center Construction Litigation, expert testimony at evidentiary hearing on the demolition of a 26-story reinforced concrete building due to the presence of construction defects. March 12 and 13, 2012.

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Trial and Deposition, Begl v. Los Angeles Unified Sch. Dist. (LAUSD), regarding evaluation of seismic retrofit to determine if design contributed to construction defects and assessment of repair procedures. 2004.

Trial, Bertram v. Fireman's Fund, regarding determination of damage and preparation of repair recommendations for a building struck by a moving truck. 2003.

Deposition, Benco v. PGH Wong—Tule River Bridge, regarding determination of failure mechanism and evaluation of faulty work design of bridge that collapsed during construction. 2003.

Trial, County of LA v. Aetna, regarding evaluation of damage and computer analyses for three building complexes damaged during the 1994 Northridge Earthquake. 2003.

Deposition and Arbitration, Krusiewicz v. Laynescape, regarding the cause of damage and recommended repair methods for a network of masonry retaining walls. 2002.

Select Papers, Lectures and Publications

"2018 Design of Reinforced Masonry Structures," Concrete Masonry Association of California and Nevada, 2018 (co-author)

"Saving a Building and a Forgotten Work of Art; Restoring L.A.'s Italian Hall Building and its Iconic Mural," Masonry Design Magazine, 2016 (author)

"Earthquake Damage Assessment of Reinforced Concrete Hotel Buildings in Hawaii," Proceedings of the 15th World Conference on Earthquake Engineering, 2012 (co-author)

"Structural Design of Low Rise Buildings in Cold-Formed Steel, Reinforced Masonry, and Structural Timber," McGraw Hill, 2012 (co-author)

"2009 Design of Reinforced Masonry Structures," Concrete Masonry Association of California and Nevada, 2011 (co-author)

"Smart Buildings: Viscous Dampers for a Tall Twisting Tower," The Structural Design of Tall and Special Buildings 19(4), 2010 (co-author)

"High performance/smart and living buildings: the benefits of using Taylor dampers on the PEER and LATBSDC concrete 42-storey high-rise building," (Part I), The Structural Design of Tall and Special Buildings 19(4), 2010 (co-author)

"Structural Design of the New Airport Traffic Control Tower at McCarran International Airport," Proceedings of the 2010 Structural Engineers Association of California (SEAOC) Convention, Indian Wells, CA, 2010 (co-author)

"The Seismic Star System: A Proposed Methodology for Classifying the Seismic Performance of Buildings," Proceedings of the 2010 Structural Engineers Association of California (SEAOC) Convention, Indian Wells, CA, 2010 (author)

"Optimization of Viscous Dampers for Reduction of Seismic Risk in Concrete Buildings using Genetic Algorithm," Proceedings of the 8th US National Conference on Earthquake Engineering, San Francisco, CA, April, 2006 (co-presenter)

"Living Buildings," The Structural Design of Tall and Special Buildings, Volume 14, No. 4, pp. 267-277, August 2005 (co-author)

"Anatomy of a Disaster: A Structural Engineering Investigation of the World Trade Center Collapses," Proceedings of the 3rd Forensics Engineering Congress, ASCE, San Diego, CA, October 2003 (co-author)

"Out-of-Plane Design of Masonry Walls," Structural Engineer, Volume 4, No. 9, pp 26-32, October 2003 (author)

"Deformation-Based Design of Shear Wall Buildings," Proceedings of the 7th US National Conference on Earthquake Engineering, Boston, MA, July, 2002 (co-author)

"Determination of the Displacement Limit for the Seismic Rehabilitation of Concrete Buildings," The Structural Design of Tall Buildings, Volume 8, No. 2, pp. 79-115, June 1999 (author)

"Effect of Flanged Walls on the Seismic Performance of Tall Buildings," The Structural Design of Tall Buildings, Volume 6, No. 4, pp. 263-267, December 1997 (co-author)

"Analytical Investigation of the Response of a Building with Added Viscous Dampers," Proceedings of the 11th World Conference on Earthquake Engineering, Acapulco, MEX, June 1996 (co-author)

"Structural Reliability Characterization of Precast Concrete," The Structural Design of Tall Buildings, Volume 2, No. 1, pp. 13-35, March 1994 (co-author)

CONTACT

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