Thornton Tomasetti

Zachary D. Kates, P.E., LEED AP

Principal

Summary

Zach Kates joined Thornton Tomasetti in 1998 and, for approximately 18 years, specialized in the management, structural analysis and design of complex building structures, including new design of large scale commercial and healthcare projects, and the renovation of existing and historic structures.

Since 2010, Zach has focused on growing Thornton Tomasetti's forensic engineering practice. Currently he leads the forensic practice in Texas. He has performed numerous forensic engineering investigations including damage assessment of existing facilities, cause and origin analysis of building and bridge failures, evaluation of construction defects, and building envelope assessment. He has been involved in emergency response for several building and bridge collapses including stabilization and deconstruction and has performed remedial design for failed structures.

Areas of Technical Expertise

- Structural Engineering
- Forensic Engineering
- Collapse Investigations
- Building Envelope Investigations
- Structural Engineering for Existing and Historic Structures

Education

- M.S., Civil Engineering, 1998, University of Texas at Austin
- B.S., Civil Engineering, 1996, University of Illinois at Urbana-Champaign

Registrations

- Licensed Professional Engineer (California, Delaware, District of Columbia, Florida, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Texas, Virginia)
- LEED Accredited Professional, Building Design and Construction
- Texas Department of Insurance Appointed Qualified Inspector

Professional Activities

- Structural Engineers Association of Metropolitan Washington (SEA-MW), Chairman 2015-2016

Teaching

- Catholic University of America, Department of Civil Engineering Advisory Board, 2012
- Architectural Studio Jury Member, University of Maryland School of Architecture, Fall Semester 2006 and 2007
- Visiting Faculty, Structures 3, Catholic University of America, Washington, DC, 2001-2004
- Graduate Teaching Assistant, The University of Texas at Austin, 1997

Certifications

- Mine Safety Health Administration Part 46 Safety Training

Select Project Experience

Structural Engineering

Station Place Building One, Washington, DC. Structural design of the Securities and Exchange Commission's 1,000,000-square-foot headquarters. The 10-story office building features post-tensioned, two-way concrete slabs with 45-foot spans, an anticlastic glass cable-net lobby enclosure, and incorporates blast resistant design consistent with General Services Administration security criteria. The project provides direct access to neighboring Union Station via a steel truss pedestrian bridge.

Station Place Building Three, Washington, DC. Structural design of a 741,000-square-foot office building featuring post-tensioned, two-way concrete slabs with 45-foot spans incorporating blast-resistant design consistent with General Services Administration security criteria. The project posed design challenges due to the proximity of active rail lines and an existing access ramp crossing the building footprint that had to remain open at all times during construction.

Martin Army Community Hospital, Fort Benning, GA. Structural design of a 745,000-square-foot design-build facility for the U.S. Army, including a 70-bed hospital, three-story concourse and a clinic building.

The Johns Hopkins Hospital, Bloomberg Children's Center and Sheikh Zayed Tower, Baltimore, MD. Structural design of a 1.6-million-square-foot hospital with a 12-story children's and maternal health tower and a 12-story critical care adult tower.

Reston Station, Building OB1, Reston, VA. Structural design of an award-winning 15-level, 620,000-square-foot building with noted designer Helmut Jahn that includes post-tensioned, two-way concrete slabs with 15-foot cantilevers, 40-foot spans, and a diagonalized, exposed concrete exoskeleton system.

Exploration Tower at Port Canaveral, Cape Canaveral, FL. Structural design of an award-winning seven-story, 22,000-square-foot welcome center located in a high-wind region.

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Forensic Engineering

Manufacturing Building Explosion and Collapse Investigation, Monterrey, MX. Performed a structural scope of damage assessment and cause and origin investigation of the explosion in a steel-framed manufacturing building.

Steel Building Collapse Investigation, TX. Performed a structural scope of damage assessment and cause and origin investigation of the collapse of a long-span, high-bay pre-engineered metal building under construction.

Hospital Explosion Investigation, TX. Performed a structural damage assessment of several buildings on a hospital campus subject to blast loads from an explosion. Work involved stabilizing collapsed portions of the structure and forensic evaluation of remaining structural components.

Earthquake Evaluations, Mexico City, MX. Performed damage assessment of multiple commercial structures affected by the 2017 Mexico City earthquake. Performed structural analysis of lateral force resisting systems to determine compliance with current codes and designed seismic retrofits.

Warehouse Collapse Investigation, Austin, TX. Collapse investigation of precast tilt-up structure following Hurricane Harvey.

Fire Evaluations, multiple locations. Performed damage assessment of multiple commercial structures affected by fire. Work included design of stabilization, recommended replacement scope, and repair design.

Roof Mezzanine Structural Evaluation, Laurel, MD. Structural investigation and load testing of an interstitial mechanical mezzanine at a manufacturing plant.

South Norfolk Jordan Bridge Construction Collapse, Chesapeake, VA. Structural investigation of a 5,375-foot-long, 35-span, precast segmental bridge to determine the cause and origin of the steel truss support system's collapse.

Dulles International Airport, Dulles Jet Center Investigation, Dulles, VA. Structural investigation of three pre-engineered metal hangars that collapsed during a record-breaking snowfall in early 2010.

Building Envelope Investigations

Hurricane Evaluations for Harvey, Irma and Michael, mulitple locations. Structural and building envelope investigations of various types of commercial, residential, and government buildings to determine damage caused by wind, water infiltration, flood, and storm surge as a result of hurricane activity in the affected areas.

Wind and Hail Evaluations, multiple locations. Building envelope investigations of various types of commercial and residential buildings to determine damage caused by wind and hail as a result of extreme weather events in the affected areas. Roofing systems evaluated included asphalt shingle, metal tile, metal panel, clay tile, concrete tile, TPO, PVC, EPDM and other various finish and cladding systems.

Structural Engineering for Existing and Historic Structures

St. Elizabeth's Center Building Renewal, Washington, DC. Modernization of an historic masonry building including temporary bracing and underpinning of the facade, demolition of the building interior, and structural design of a new 250,000-square-foot concrete frame constructed within the historic façade.

Capitol Hill Office Building Renewal, Washington, DC. Modernization of an historic six-story, 800,000-square-foot office building built in 1908.

Sworn Testimony

Deposition, Multi-Story Concrete Residential Building, Bethesda, MD. Investigation of existing brick facade to determine extent of damage following construction of adjacent new building. January 2019.

Deposition, Masonry Structure Collapse Investigation, Washington, DC. Investigation to determine cause of masonry wall collapse at a three-story structure. March 2016.

Deposition, Commercial Office Building, Washington, DC. Structural investigation of impacts of new construction adjacent to an existing building. November 2014.

Deposition, Intermodal Transportation Facility, Beckley, WV. Structural investigation of a project involving standard of care of construction administration services. March 2014.

Trial, Bain and Associates Inc. et al vs. John C Flood of Virginia Inc., Alexandria, VA. Structural investigation of an historic wood-framed structure to determine structural impacts of added rooftop mechanical equipment. July 2004.

Litigation

Student Housing Construction Defect Investigation, Charlotte, NC, regarding litigation support and cause and origin investigation of multiple multi-story, wood-framed buildings to determine the root cause of alleged construction defects in the structural framing.

Residential Pool Investigations, Austin and San Antonio, TX, regarding litigation support and structural investigation to evaluate alleged construction defects at a residential pool.

Site Grading Investigation, Baltimore, MD, regarding litigation support and civil engineering investigation to evaluate adequacy of design drawings in determine cut and fill volumes for a parking lot at a government facility.

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Residential House and Pool Investigation, Austin, TX, litigation support and structural investigation to evaluate building movement and cracking.

EZ Storage, South Bowie, MD, regarding litigation support and structural investigation to determine the cause of concrete slab delamination at a 40,000-square-foot storage facility.

Home Depot Warehouse, Brooklyn, NY, regarding litigation support and structural investigation to determine the cause of cracking in a pile-supported two-way concrete structural floor slab at a warehouse facility. Analysis included 3D modeling, nondestructive testing by ground-penetrating radar, and evaluation of slab repair techniques.

Alternative Dispute Resolution

Truss Bridge Collapse Investigation and Retrofit/ Replacement, MS, regarding structural investigation and assessment to determine the cause and origin of the collapse of a steel truss bridge at a manufacturing facility. Work included retrofit of existing structures to remain, design of replacement truss, and presentation at mediation proceedings.

Pedestrian Bridge, Rockville, MD, regarding litigation support and structural investigation of impacts of steel detailing and sequencing during bridge construction. Work included presentation during mediation proceedings.

University of Connecticut, Biology / Physics Building Investigation, Storrs, CT, regarding litigation support and structural investigation into a claim by the structural steel subcontractor relating to the cause of construction delays. Work included participation in mediation sessions.

Papers, Publications and Presentations

"Best Practices in Cause and Origin Investigation," The University of Texas Forensic Engineering Conference, Austin, TX, February 14, 2019 (Presenter)

"Forensic Engineering: Luck or Skill," The University of Texas Forensic Engineering Conference, Austin, TX, February 21, 2018 (Presenter)

"How Forensic Engineering is Still Influencing New Design," The University of Texas Forensic Conference, Austin, TX, February 23, 2017 (Presenter)

"Investigating a Large Loss: The Dulles Jet Center Collapse," University of Texas STEER Conference, Austin, TX, September 22, 2016 (Presenter)

"Five Things I've Learned Since Graduation," SEA-MW Future Engineer's Forum, Washington, DC, November 20, 2015 (Presenter)

"Next Generation Steel," AISC NASCC Steel Conference, Nashville, TN, March 26, 2015 (Presenter)

"Building Up the Fort, Fort Benning Martin Army Community Hospital," Modern Steel Construction, February 2014 (Co-author)

"Sea and Space, Port Canaveral Visitors Center," Modern Steel Construction, October 2013 (Co-author)

"The Healing Power of In-Model Review," AISC Shop Model Review and Approval Workshop, Washington, DC, March 14, 2013 (Presenter)

"Engineering the NCB," Johns Hopkins Society of Engineering Alumni, Baltimore, MD, March 18, 2012 (Presenter)

"The Two Towers, Johns Hopkins Hospital New Clinical Building," Modern Steel Construction, November 2008 (Co-author)

"Five Things You Should Know About Structural Engineering," Cardozo High School Construction Academy, Washington, DC, November 28, 2007 (Presenter)

"Waclaw Zalewski - Shaping Structures," University of Maryland, Gallery Talk, September 27, 2007 (Panel Member)

2007 Steer Conference at The University of Texas at Austin, March 23, 2007 (Presenter)

"Structural Failures: Past, Present, and Future," Catholic University of America, School of Architecture and Planning, Alumni Continuing Education Program, November 12, 2004 (Presenter)

"Construction Methods at Station Place Building One," ASCE / Iraqi Delegation of Construction Officials, October 19, 2004 (Presenter)

"Overview of Structural Systems for High-Rise Buildings," 2003 Boston Society of Civil Engineers / ASCE Structural Group Lecture Series, 2003 (Co-author and Presenter)

"Experimental Effects of Power Actuated Fasteners on the Behavior of Open-Web Steel Joists," UT Austin Master's Thesis, 1998 (Author)

Contact

Zachary D. Kates
115 Wild Basin Road, Suite 309
Austin, TX 78746
D 512.580.1753 | M 202.641.1971
ZKates@ThorntonTomasetti.com
www.ThorntonTomasetti.com