Thornton Tomasetti

Joelle Nelson, P.E.

Associate Principal

Summary

Ms. Nelson joined Thornton Tomasetti in 2004 and has extensive experience with advanced detailed structural modeling. Her project experience consists primarily of crane reviews and collapse investigations, major renovations of existing structures and design of unusual and complicated structures, and includes a wide variety of projects such as kinetic structures, forensic investigations, construction engineering, deconstruction and property loss consultation. She has expertise in wind load investigations of damaged and collapsed structures due to hurricanes, tornadoes and thunderstorms, and in the design and analysis of wind sensitive structures.

Areas of Technical Expertise Include

- Forensic Investigation
- Property Loss Consulting
- Construction Support
- New Design
- Rehabilitation and Renovation

Education

- M.S., Civil Engineering, 2005, Columbia University, New York, NY
- B.S., Civil Engineering, 2004, Columbia University, New York, NY

Registrations

- Licensed Professional Engineer (Florida, New York)

Professional Activities

- Vice Chair, ASCE 7-2022 Chapter 29 Task Committee
- Associate Member, ASCE 7-2016 Wind Subcommittee

Select Project Experience

Forensic Investigation

157 W. 57th St. Tower Crane Collapse, New York, NY. Investigation of the cause of a tower crane collapse during Hurricane Sandy.

Confidential Mobile Crane Collapse, confidential location. Cause and origin investigation of mobile crane collapse.

Confidential Stadium, confidential location. Advanced analysis and remediation of newly constructed stadium with structural design and erection issues.

Indiana State Fair Commission Collapse Incident Investigation and Report, Indianapolis, IN. Structural engineering services related to an independent Cause and Origin opinion regarding the failure of a ground-supported temporary entertainment rigging structure on the evening of August 13, 2011.

Property Loss Consulting

Confidential Tornado Damage Assessment, confidential location. Structural damage assessment for a steel-braced industrial building that experienced tornado damages including a P-delta analysis and model to determine its strength in the deformed condition and the actual in-place column to beam connections to assess and prescribe reasonable repair schemes.

Liberty Mutual, Arabi and New Orleans, LA. Structural analysis of two structures damaged in hurricane Katrina to determine the cause of damage, whether wind or flood, for an insurance claim. Scope included on-site investigation, research of actual wind speeds and water levels, and calculations of wind loads and buoyancy effects on the roof.

Construction Support

New York University Hospitals Center, Helen L. and Martin S. Kimmel Pavilion, New York, NY. Erection engineering provided for a 22-story healthcare facility including production of rigging diagrams for complex steel members, development of crane pick plans and design of temporary support trusses to

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enable erection of base building steel within the confines of a challenging and crowded site.deformed condition and the actual in-place column to beam connections to assess and prescribe reasonable repair schemes.

New Design

U.S. Bank Stadium, Minneapolis, MN. Structural design of a 1.7-million-square-foot, 65,000-seat stadium designed to host NFL football, MLS soccer, NCAA basketball and baseball and other events. The facility features a series of operable panels in a glass end-wall that pivot to provide natural ventilation and access to the west plaza. A clear 240,000-square-foot ETFE system on the roof's southern half will promote natural daylighting and produce additional solar gain to warm the stadium.

Rehabilitation and Renovation

United States Capitol Dome Rehabilitation Phase II, Washington, DC. Structural engineering services for the rehabilitation of the dome including analysis of the cast-iron dome and design of repaired components. The project included determination of allowable loads for scaffolding the dome during the rehabilitation project.

Roosevelt Island, Aerial Tramways and Stations, New York, NY. Condition assessment, structural design, contract documents and construction project management for the rehabilitation and equipment upgrade of the aerial tramway and stations.

195 Broadway, New York, NY. Structural engineering services for renovation work to a landmarked lobby of an early 20th-century building including analysis of the existing steel structure with a terracotta arch and concrete mesh slabs with no existing structural drawings, probing of the existing framing, and design of reinforcement for new openings and loads imposed by a new 30-foot glass partition wall.

Papers, Publications and Presentations

"Scaffolding a Landmark: the Restoration of the Dome of the United States Capitol Building," ASCE Structures Congress, Denver, April 8, 2017 (Co-author)

"Tight Coverage," Modern Steel Construction, page 36-40, November 2016

"Wind Loading on Multi-Layer Open Frame Structures: A Comparison of International Code Provisions," Proceedings of the XIII Conference of the Italian Association for Wind Engineering: In-Vento 2014, June 2014

"The Roosevelt Island Tramway Modernization Project," ASCE 6th Forensic Congress Proceedings, November 2012

"The Indiana State Fair Collapse Incident: Anatomy of a Failure," ASCE 6th Forensic Congress Proceedings, November 2012 (Co-author)

"Aerial Advancement," Roosevelt Island Tramway, CE Magazine, page 66, October 2011

Contact

Joelle Nelson
40 Wall Street
New York, NY 10005
212.367.2990
JNelson@ThorntonTomasetti.com
www.ThorntonTomasetti.com