

## Elisabeth A. Malsch, Ph.D., P.E.

### Principal



#### Summary

Dr. Malsch joined Thornton Tomasetti in 2005 and is the head of the Advanced Analytics group. She has more than 15 years of experience in modeling the mechanical behavior of structures, and for the past twelve years, has focused on structural analysis and design, specializing in investigative projects and restoration of historic structures. Dr. Malsch is proficient in static, dynamic, and nonlinear analysis and evaluation of buildings, parking garages, space frames, domes and scaffolds under the effects of wind, seismic forces, vibration and blast loads.

#### Areas of Technical Expertise

- Forensic Structural Engineering
- Structural Engineering – Alterations and Rehabilitations
- Structural Stabilization

#### Education

- Ph.D., M.Phil, M.S., Engineering Mechanics, 2003, 2001, 2000 (respectively), Columbia University
- B.S., Civil Engineering, 1999, Columbia University

#### Registrations

- Licensed Professional Engineer (Connecticut, New Jersey, New York, Massachusetts)

#### Professional Activities

- American Society of Civil Engineers (ASCE)
- International Association for Bridge and Structural Engineers (IABSE)
- American Society for Testing and Materials (ASTM) E58.06 Incidents Involving Structures
- Sigma Xi, The Scientific Research Society

#### Academic Research and Teaching

- Adjunct Assistant Professor, Columbia University, Since 2010
- Fellow, Technische Universitat Braunschweig, Germany, 2004-2005
- Post-Doctoral Researcher, Columbia University, 2003-2004

#### Honors and Awards

- Top 20 Under 40, Engineering News Record, 2012
- 40 Under 40, Building Design and Construction, 2012
- Alexander von Humbolt Fellowship, 2004

#### Select Project Experience

##### Forensic Structural Engineering

**I-35 West Bridge Collapse**, Minneapolis, MN. Investigation to determine the cause of the steel truss bridge collapse.

**Reliant Stadium**, Houston TX. Investigation to determine the extent and cause of fabric roof damage immediately after Hurricane Ike.

**Tropicana Parking Garage Collapse**, Atlantic City, NJ. Investigation to determine the cause of the cast-in-place structure's collapse during construction.

**Boston Tunnel Overhead Panel Anchor Failure**, Boston, MA. Investigation to determine the anchor capacity and review of NTSB conclusions.

##### Structural Engineering – Alterations and Rehabilitations

**Sherman Minton Bridge**, Spans from KY to IN. Retrofit of a fracture critical bridge.

**George Washington Bridge Bus Station**, New York, NY. Structural evaluation and feasibility study for the expansion of the existing structure.

**Newark City Hall Dome and Skylight Restoration**, Newark, NJ. Structural engineering in support of a dome restoration.

**7-9 East 72nd Street**, New York, NY. Renovation of an existing historic building including underpinning of the existing construction, new foundations and foundation walls.

##### Structural Stabilization

**Cabelas Building Settlement**, WV. Stabilization of a distressed steel-framed warehouse resulting from an uneven building settlement.

**6 York Street**, New York, NY. Emergency retrofit and shoring of a building under construction.

**130 Liberty Street**, New York, NY. Stabilization of a 50-story building during deconstruction activities.

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**Sworn Testimony**

**Testimony**, Grandview at Riverwalk Port Imperial Condominium Association v. K. Hovnanian at Port Imperial et al. Hudson County Superior Court, NJ. April 24, 2017.

**Deposition**, Charles Riffkind vs. O'Neill Condominium Association, NMC Property Management, LLC, Ladies Mile, INC., and Olympic Funding, LLC. September 21, 2015.

**Deposition**, PREF 34 East 51st Street LLC vs. Sciame Construction LLC. November 18, 2014.

**Papers, Publications and Presentations**

"Environmental Loading on Temporary Structures Based on the 2014 NYC Building Code," ASCE Forensic Engineering 7th Congress, Miami, FL, November 15-18, 2015 (Co-presenter)

"Investigation of Sprayed Fire-Resistive Material and In-Situ Bond Failure," ASCE Forensic Engineering 7th Congress, Miami, FL, November 15-18, 2015 (Co-presenter)

"Investigation of Fragment Impact and Blast Shock Wave on Window Breakage," ASCE Forensic Engineering 7th Congress, Miami, FL, November 15-18, 2015 (Co-presenter)

"Modeling Failure Progression in Structures Informed by Demolition," CFRAC 2015, the Fourth International Conference on Computational Modeling of Fracture and Failure of Materials and Structures, Paris, France, June 3-5, 2015 (Co-presenter)

"Dangers of Lot Line Retrofits and Construction," International Association for Bridge and Structural Engineering (IABSE), Helsinki, Finland, February 11-12, 2015 (Co-presenter)

"Learn About 3D Printing," NYCLA Construction Law Committee, New York, NY, April 23, 2014 (Presenter)

"Forensic Information Modeling in Bridge Renovation: Sherman Minton Bridge," IABMAS 7th International Conference on Bridge Maintenance, Safety and Management, Shanghai, China, July 7-11, 2014 (Presenter)

"Forensic investigation in the age of the internet of things," 37th IABSE Symposium, Madrid, Spain September 3-5, 2014 (Presenter)

"Informed Structures: Forensic Information Modeling Lessons Learned," Forensic Engineering, ICE, September, 2014 (Presenter)

"Evaluation of super-tall steel columns subjected to blast loading using SDOF and finite element analysis methods," 11th International Conference on Structural Safety & Reliability, Columbia University, New York, NY, June 2013 (Co-author)

"Calculating Collapse: Analytical Approaches for Investigating the Cause of the I-35 West Bridge Failure," Fifth International Conference for Forensic Engineering, London, April 16-17, 2013 (Co-author)

"Forensic Investigation Modeling (FIM) Approach: I-35 West Bridge Collapse Case Study," Sixth Congress on Forensic Engineering, San Francisco, CA, October 31 - November 3, 2012 (Co-author)

"How Computers Lie: the fact and fiction of computer simulations in court cases," Construction Super Conference, San Francisco, CA, December 2012 (Co-author)

"Beyond the Project Scope" ASCE Met Section, June, 2010 (Presenter, Co-author)

"Recent advances in the construction of polygonal finite element interpolants," Archives of Computational Methods in Engineering, 2005, v.11 n. 4 (Co-author)

"Smooth two dimensional interpolants: a recipe for all polygons," Journal of Graphics Tools (ACM: 2005) v.10 n.2 pp. 27-39 (Co-author)

"Extension of the cloning algorithm: modeling soil-structure interaction in heterogeneous foundations," Lecture Series on Computer and Computational Sciences. v.1, 2004, pp. 1-3 (Presenter)

"Shape functions for polygonal domains with interior nodes," International Journal for Numerical Methods in Engineering (Wiley: October 2004). v.61 issue 8 pp.1153-1172 (Co-author)

"Interpolation constraints and thermal distributions: a method for all non-concave polygons," International Journal of Solids and Structures. v.41 n.8. pp. 2165-2188 (Co-author)

"Boundary element color interpolation for instrumentation, imaging and internet graphics industries," International Journal of Engineering Analysis with Boundary Elements, Rencis ed. (Elsevier Science: January 2002). pp.379-389 (Co-author)

"First Order Stochasticity in Boundary Geometry: A Computer Algebra BE Development," International Journal of Engineering Analysis with Boundary Elements, n.25 (Elsevier Science: February 2001) pp.741-751 (Co-author)

**Contact**

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