

# Dennis M. McCann, Ph.D., P.E.

President

Dennis McCann serves as President of CTLGroup with responsibilities including operations oversight and strategy for the firm. Dr. McCann's professional practice focuses on forensic engineering, risk assessment, and performance evaluation of structures and infrastructure. He advises clients regarding technical problems across several market sectors, including buildings, energy, transportation, and infrastructure sectors. Within these sectors, he often consults on matters involving property loss and failure avoidance.

Dr. McCann has studied the cause of catastrophic structural collapses and has responded in the aftermath of several major natural disasters. He has also investigated design and construction defects or deterioration that has resulted in loss of performance or undesirable structural behavior. His efforts in performance evaluation have included the development and implementation of monitoring systems to assess the behavior and health of in-service structures and infrastructure. Dr. McCann has applied his expertise to residential and commercial buildings, bridges, temporary works, foundations, stacks, tanks, towers, and other industrial structures.

Dr. McCann has a strong background in engineering mechanics with a specialty in structural dynamics and vibrations. His experience includes analysis of structural response to wind, earthquake, and blast loads, as well as monitoring and mitigation of vibration effects. Dr. McCann's technical background extends to probabilistic analysis to support risk management and decision making.

Prior to joining CTLGroup, Dr. McCann held positions with a leading multi-disciplinary engineering and scientific consulting firm. He also has past experience performing analysis and design tasks for water resources facilities and geotechnical systems. Dr. McCann has taught civil engineering courses and has served as a peer reviewer for academic journals and industry publications. He has also served as a Structures Specialist for the Illinois Urban Search and Rescue Team.

## Representative Project Experience

### Failure Investigation

- Served as lead structural engineering expert on team investigating the tragic collapse of the Champlain Towers South condominium in Surfside, Florida. Investigation included study of the original structural design and pre-collapse conditions, site investigation and material sampling, artifact examination, hypothesis development and analysis, and technical support for the mediation process in the civil litigation.
- Investigated the failure during construction of a nearly 800 foot long steel sheet pile bulkhead and pile-supported river walk structure in Georgia. Evaluated the adequacy of the structural design and assessed reparability as part of the builder's risk insurance loss recovery process.

### Failure Investigation (Continued)



### Academic Credentials

Ph.D. in Civil Engineering  
The Johns Hopkins University, 2001

M.S.E. in Civil Engineering  
The Johns Hopkins University, 2000

B.S. in Civil Engineering  
University of Notre Dame, 1993

### Credentials Heading

#### Professional Engineer

CO, FL, IL, IN, IA, KS, LA, MI, MD,  
MN, NC, NJ, NV, NY, OH, VA, WV,  
USVI

NCEES

### Contact Information

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DMcCann@CTLGroup.com

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- Served as lead investigator studying the partial collapse of a pre-engineered metal building warehouse facility in Maryland following a major winter storm. Assessed original design and as-built conditions, and oversaw the conceptual design of a replacement structure for the purposes of property loss recovery.
- Investigated the failure of an earth retention system, which was constructed as part of a major metropolitan sewage treatment plant expansion project, and associated earth embankment collapse that impacted operations of an adjacent mass transit rail line. The investigation included structural design review, computational modeling and simulation of the structural failure, and analysis of slope stability.
- Led the investigation into the collapse of a form traveler used to construct a cable stayed bridge in Puerto Rico. Oversaw nondestructive evaluation and metallurgical studies, design and fabrication review, and structural analysis. Evaluated contribution of design and fabrication defects on the failure. Provided expert witness services during dispute resolution.
- Performed a failure investigation following a construction accident during widening of a combined rail and highway bridge in Louisiana. Documented the failure scene, preserved evidence, and analyzed the guy wire system and other temporary works used to stabilize the in-progress construction.
- Managed the failure investigation of a steel box-girder bridge in New York that collapsed during a concrete deck pour. Documented failure scene and participated in evidence preservation program with other experts. Conducted design review, assessed construction loads, and performed finite element analyses to test failure theories.
- Investigated the collapse of a 10-story rack structure in Wisconsin. Conducted field investigation to document scene and identify evidence for preservation. Evaluated welded connections of structural assemblages. Performed design review and computational analyses to assess the stability of the structure under various failure scenarios.

## Disaster Response

- Responded in the wake of several major natural disasters including Hurricanes Wilma, Katrina, Ike, Harvey, Irma, and Maria, as well as river flooding, tornadoes, and severe weather outbreaks in the Midwest. Evaluated nature, extent, and reparability of damage to residential and commercial properties following these catastrophes
- Served as structural engineering expert on multidisciplinary teams investigating accidental explosions at various industrial, agricultural, and petrochemical sites. Performed structural blast indicator analysis to determine magnitude of explosion pressures as part of origin and cause analysis of combustible dust and vapor cloud explosions.

## Structural Performance Evaluation

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- Led multidisciplinary team of structural and materials engineers investigating alleged defective construction of a steel fiber reinforced concrete building. Managed extensive field sampling study and laboratory analysis of materials. Conducted design review and performed structural analysis, including non-linear, dynamic finite element analysis, to assess the effect of deviations from material specifications on structural performance.
- Investigated the cause of steel bearing plate performance issues and concrete damage on large precast concrete girders erected as part of elevated transit rail infrastructure expansion project on the east coast. Supported contractor team with the development of repair solutions.
- Evaluated the impact of interior wall corrosion on the performance of two steel stacks at a chemical processing plant in Louisiana. Assisted plant managers with risk analysis and recommended repair alternatives.
- Conducted a performance assessment of a water tank at a power plant in Virginia. Analyzed the impact of foundation settlement and made recommendations for future monitoring.

## Monitoring of In-Service Structures

- Developed a structural monitoring program aimed at managing risk of damage to a sensitive structure adjacent to a construction site on a dense urban higher education campus in Chicago. Implemented multi-node vibration, settlement, and tilt monitoring systems that operated throughout demolition and construction activities, and ensured regular reports and alerts were provided to the university to aid the risk management effort.
- Developed a structural monitoring program aimed at managing risk of damage to a sensitive structure adjacent to a construction site on a dense urban higher education campus in Chicago. Implemented multi-node vibration, settlement, and tilt monitoring systems that operated throughout demolition and construction activities, and ensured regular reports and alerts were provided to the university to aid the risk management effort.
- Monitored dynamic response of stay-cables and analyzed measurement data to estimate cable damping and tension as part of the recurring inspection program for the East Huntington Bridge over the Ohio River.
- Designed and implemented a structural monitoring system as part of load testing at a nuclear power plant in Michigan conducted to validate structural response to new cask transporter loads that were heavier than the original design.
- Conducted a vibration study of large reactors at a chemical processing facility in Illinois. Performed modal testing, monitored vibrations during operations, conducted structural condition assessments, and made recommendations for design improvements to mitigate unwanted vibrations and improve long-term performance.

## Publications

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# Dennis M. McCann, Ph.D., P.E.

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- McCann, D.M., Viz, M.J. **Risk-based Inspection and Hazard Assessments: Analogs for Civil Infrastructure.** American Society of Civil Engineers, Structures Congress, Portland, Oregon. April 2015.
- Ogle, R.A., McCann, D.M., Viz, M.J. **Sizing Safety Stock for Supply Chain Risk Management.** American Institute of Chemical Engineers, 2011 Annual Meeting, Minneapolis, Minnesota. October 2011.
- Corr D.J., McCann D.M., McDonald B.M. **Lessons learned from the Marcy bridge collapse. Forensic Engineering 2009 – Pathology of the Built Environment,** Proceedings of the 5th Congress on Forensic Engineering, Washington, DC, November 11–14, 2009.
- Smith S., Bilow D., McCann D., Kamara M. **A Complete Guide to Blast-Resistant Design of Low Rise Reinforced Concrete Buildings.** 17th IABSE Congress, Creating and Renewing Urban Structures—Tall Buildings, Bridges and Infrastructure, Chicago, IL, September 17–19, 2008.
- Peraza D.P., McCann D.M. **Avoiding Structural Failures During Construction - Part 2.** Structure Magazine, February 2008.
- McCann D.M., Smith S.J. **Blast Resistant Design of Reinforced Concrete Structures.** Structure Magazine, April 2007.
- McCann D.M., Weaver B.T., Smith S.J., Meacham E.M. **Modal Testing Diagnosis of Bus Seat Failures.** IMAC XXII, Society of Experimental Mechanics, Dearborn, MI, January 2004.
- McCann D.M., Jones N.P. **Systems-Based Approach to Evaluating Structural Condition Assessment Methods.** Proceedings, Workshop on Management of Civil Infrastructure Systems in Multihazard Environments, Jones NP (ed), 2001.
- McCann D.M. **The value of Information In Structural Performance Assessment.** Ph.D. Dissertation, The Johns Hopkins University, Baltimore, MD, 2000.
- McCann D.M., Jones N.P., Ellis J.H. **Role of Global NDE Techniques in Structural Performance Assessment.** Proceedings, 14th ASCE Engineering Mechanics Conference, Austin, TX, 2000.
- McCann D.M., Jones N.P., Ellis J.H. **Evaluating The Utility of Global Damage Detection Methods for Highway Bridges.** Proceeding, 5th Annual Symposium on Nondestructive Evaluation and Health Monitoring of Aging Structures, Newport Beach, CA, 2000.
- McCann D.M., Jones N.P., Ellis J.H. **Toward Consideration of The Value of Information In Structural Performance Assessment.** Proceedings, Structural Engineering World Congress, San Francisco, CA, 1998.
- Kirkner D.J., Caulfield P.N., McCann D.M. **Three Dimensional Finite Element Simulation of Permanent Deformations in Flexible Pavement Systems.** Transportation Research Record, No. 1448, pp. 34–39, 1994.
- McCann D.M. **Response of an Elastic-Plastic Layer to a Moving Load.** Proceedings, 7th NCUR, Salt Lake City, UT, 1993.

## Books

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- Smith S.J., McCann D.M., Kamara M.E. **Blast Resistant Design Guide for Reinforced Concrete Structures**. Portland Cement Association, 2009. ISBN 978-0-8932-270-6.

## Conferences and Seminars

### Presenter/Panelist

- **Advances in Forensic Engineering of Concrete Structures**, RC 4.0 Reunión del Concreto Virtual, Cartagena de Indias, Columbia, September 24, 2020.
- **Monitoring Structural Response During Load Tests at a Nuclear Power Plant**, Exelon Structural Partners Meeting, Warrenville, IL, August 22, 2017
- **Structural Vibrations: Measurement & Diagnosis**, Iowa ASCE Structural Engineering Conference 2016, Ames, IA, November 17, 2016.
- **Eyes in the Sky: Drones in Facility Management**, National Facilities Management & Technology, Baltimore, MD, March 24, 2016.
- **A Primer on Structural Vibrations**, Iowa ASCE Structural Engineering Conference 2014, Ames, IA, November 10, 2014.
- **Construction Accidents – An Engineer's Perspective**, Defense Trial Counsel of Indiana 17th Annual Conference + Meeting, November 18, 2010.
- **Lessons Learned from the Marcy Bridge Collapse**, Forensic Engineering 5th Congress – Pathology of the Built Environment, November 2009.
- **Evaluating the Utility of Global Damage Detection Methods for Highway Bridges**. SPIE 5th Annual Symposium on Nondestructive Evaluation and Health Monitoring of Aging Structures, Newport Beach, California, May 2000.
- **Toward Consideration of the Value of Information in Structural Performance Assessment**. Structural Engineers World Congress, San Francisco, California, July 19-23, 1998.

### Invited Lectures

- McCann D.M. **Explosion investigations – A Structural Engineer's Perspective**. Engineering Forensics Course, Department of Civil Engineering, Northwestern University, May 12, 2011.
- Wren J.R., McCann D.M. **Epic failures**. William A. and Joyce R. Bell Excellence Fund for Civil Engineering Lecture, Western Kentucky University, October 5, 2010.
- McCann D.M. **Blast Effects on Structures – A Primer on Blast Resistant Design**. Structural Engineers Association of Washington, Spokane Chapter, April 20, 2010.
- McCann D.M. **Blast Resistant Design Basics**. Steel Structures Design Course, Department of Civil Engineering, Northwestern University, March 13, 2009 and June 1, 2010.

### Prior Experience

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- **CTLGroup, Skokie, Illinois**  
Vice President and Chief Operating Officer, 2018-2020  
Senior Principal Engineer and Director, Materials & Mechanics Group, 2017  
Principal Engineer and Director, Materials & Mechanics Group, 2015 – 2016  
Principal Engineer and Director, Naperville, Illinois Office, 2011 – 2014
- **Exponent, Inc., Buildings and Structures Practice, Chicago, Illinois**  
Senior Managing Engineer, 2008–2011  
Managing Engineer, 2005–2007  
Senior Engineer, 2003–2004  
Engineer, 2001–2002
- **The Johns Hopkins University, Baltimore, Maryland**  
Post-Doctoral Fellow, Department of Civil Engineering, 2000  
Courses Taught: Engineering Mechanics, Dynamics  
Instructor, Part-Time Programs in Engineering and Applied Sciences, 2000  
Courses Taught: Wind + Earthquake Engineering
- **Lawson-Fisher Associates, P.C., South Bend, Indiana**  
Civil Engineer, 1993–1995

## Additional Experience

- Structures Specialist, Illinois Urban Search and Rescue – Task Force 1, Illinois Emergency Management Agency/Illinois Terrorism Task Force, 2003–present

## Professional Honors

- Abel Wolman Graduate Fellow, The Johns Hopkins University
- Walter L. Shilts Award for Undergraduate Achievement, University of Notre Dame
- Chi Epsilon, Civil Engineering Honor Society
- Sigma Xi, Scientific Research Society

## Professional Affiliations

- Abel Wolman Graduate Fellow, The Johns Hopkins University
- American Society of Civil Engineers, Member
- American Concrete Institute, Member
- American Institute of Steel Construction, Member
- Structural Engineers Association of Illinois, Associate Member
- American Association for Wind Engineering, Member