

# David Corr, Ph.D., P.E.

Principal Engineer & Materials Consulting Group Director

David Corr serves as Materials Consulting Group Director at CTLGroup and is one of the nation's leading experts related to materials characterization, structural performance, and infrastructure materials development. Dr. Corr's knowledge focuses on both traditional and emerging building materials. Specifically, he has studied the durability of concrete, the rheology and fresh-state behavior of concrete, and fracture and cracking in cement-based materials.

Prior to joining CTLGroup, Dr. Corr was Clinical Professor and the Director of Graduate Studies in the Department of Civil & Environmental Engineering at Northwestern University. His most current research focused on nanotechnology of cement-based materials, large-scale additive manufacturing (3D printing), and cross-laminated timber. Dr. Corr has also conducted research in structural health monitoring, structural diagnostics, data analysis of structural performance, failure analysis and forensic engineering. He is a member of the American Concrete Institute (ACI), the past Chair of the Cements Division of the American Ceramic Society and is a licensed professional engineer in the states of Illinois and Michigan.

## Patents and Developments

- Managed an investigation into the cause and origin of excessive cracking in a water retaining concrete structure in Canada. Evaluated concrete mixture design characteristics and rebar details against pertinent industry documents including ACI 350 to evaluate hypotheses for lack of water-tightness.
- Managed an investigation into excessive cracking in precast concrete box girder segments for a commuter rail line in the Philippines. Assessed mixture design characteristics and temperature profiles to determine susceptibility to shrinkage cracking and delayed ettringite formation.
- Investigated the failure investigation of a steel box-girder bridge in New York that collapsed during construction. Determined construction loads, and conducted finite element modeling to test failure theories.
- Investigated the collapse of a 10-story rack structure in Wisconsin. Performed design calculations and computational modeling to assess the stability of the structure under various failure scenarios.
- Responded in the wake of multiple major natural disasters including Hurricane Katrina and the Kiholo Bay earthquake in Hawaii. Evaluated nature, extent, and reparability of damage to residential and commercial properties following these catastrophes.

## Academic Experience

- Director of Graduate and Undergraduate Studies, Civil and Environmental Engineering, 9/2012 – 10/2022.
- Clinical Professor, Civil and Environmental Engineering, Northwestern University, 1/2018 - 10/2022.
- Charles Deering McCormick University Distinguished Clinical Professor, 9/2014 to 9/2015.



## Academic Credentials

Adjunct Professor, Civil and Environmental Engineering  
Northwestern University  
Evanston, IL

Ph.D. in Civil Engineering  
University of California, Berkeley  
Berkeley, CA 2001

M.S. in Civil Engineering  
University of California, Berkeley  
Berkeley, CA 1998

B.S. in Civil Engineering  
University of Notre Dame,  
South Bend, IN 1996

## Licensure & Certifications

Illinois Licensed Professional Engineer #62059436

Michigan Licensed Professional Engineer #6201312238

## Professional Affiliations

American Concrete Institute (ACI), Member

American Ceramic Society (ACerS) Credentials Body

## Contact Information

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DCorr@CTLGroup.com

# David Corr, Ph.D., P.E.

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- Clinical Associate Professor, Civil and Environmental Engineering, Northwestern University, 9/2008 - 12/2017.
- Joint Appointment with Northwestern University Infrastructure Technology Institute, 9/2008 – 8/2013.

## Recent Publishing History

- Marrero Rosa RE, Corr DJ, Espinosa HD and Shah SP (2023), “Characterization of adhesion strength between carbon nanotubes and cementitious materials,” *Cement and Concrete Composites* 138
- Marrero Rosa RE, Cusatis G, Shah SP and Corr DJ (2023), “Characterization of Contact Creep Behavior on Carbon Nanoreinforced Cementitious Composites,” in preparation.
- Mendu K, Corr DJ and Shah SP (2023), “Influence of CNF on Portland Cement Hydration Products using FTIR-DRIFT, Raman Spectroscopy, and X-ray Diffraction Studies,” in preparation.
- Tong D, Brown SA, Landis E, Corr D and Cusatis G (2023), “Orthotropic Hygroscopic Behavior of Mass Timber: Theory and Computation,” in preparation.
- Mendu K, Guiney LM, Hersam MC, Shah SP and Corr DJ (2023), “Characterization and scalability of carbon nanofiber dispersions in aqueous solutions for cementitious nanocomposites,” *Cement and Concrete Composites*, under review.
- Mete F, Kosnik DE and Corr DJ (2022), “Long-term monitoring of bridge performance using structural health monitoring and weigh-in-motion data,” in preparation.
- Mete F, Corr DJ, Wilbur M and Chen Y (2021), “Bridge response and heavy truck classification framework based on a two-step machine learning algorithm.” *Transportation Research Record*, published online December 2, 2021.T
- Tong D, Brown SA, Corr D and Cusatis G (2020), “Wood creep data collection and unbiased parameter identification of compliance functions,” *Holzforschung - Wood Research and Technology*.
- Li Z, Corr DJ, Han B and Shah SP (2020), “Investigating the effect of carbon nanotubes on early age hydration of cementitious composites with isothermal calorimetry and fourier transform infrared spectroscopy,” *Cement and Concrete Composites* 107.
- D’Alessandro A, Corr DJ and Shah SP (2019), “Use of Tetraethyl Orthosilicate to improve durability of ferrocement,” *ACI Materials Journal* 116(6), 159-168.
- Tao S, Gao Y, Corr DJ and Shah SP (2019), “FTIR study on early-age hydration of carbon nanotube-modified cement-based materials,” *Advances in Cement Research* 31(8), 353-361.
- Xu J, Shen W, Corr DJ, and Shah SP (2019), “Effect of nanosilica on cement grain-CSH gel interfacial properties quantified by modulus mapping and nanoscratch,” *Materials Research Express* 6(4).

## Conference Proceedings

# David Corr, Ph.D., P.E.

Principal Engineer & Materials Consulting Group Director

- Kosnik DE, Hopwood T and Corr DJ (2011), "Acoustic Emission Monitoring for Assessment of Steel Bridge Details, American Institute of Physics, July 2010, San Diego, CA.
- Corr D, McCann D and McDonald B (2008), "Lessons Learned from March Bridge Collapse," ASCE 5th Congress on Forensic Engineering, November 2009, Washington, DC.
- Landis E and Corr DJ (2006), "Three Dimensional Analysis of Air Void Systems in Concrete," 16th European Conference of Fracture, 2006, pp. 517-524.
- Corr DJ and Shah SP (2005), "Concrete Materials Science at the Nanoscale," Keynote Paper, Global Construction: Ultimate Concrete Opportunities, July 5-7, 2005, Scotland.
- Corr DJ, Graham-Brady LL, Igusa T, Der Kiureghian A (2003), "Reliability of Service Life Predictions for Concrete under Sulfate Attack," Proceedings, 9th International Conference on Applications of Statistics and Probability in Civil Engineering, Millpress, Rotterdam.

## Accomplishments

- Charles Deering McCormick University Distinguished Clinical Professor, Northwestern University. Awarded 2014.
- Certificate of Teaching Excellence, McCormick School of Engineering and Applied Science. Awarded 2011.
- Northwestern University Faculty Senate, representative of McCormick non-tenure track faculty, 2016-2018.
- American Ceramic Society (ACerS), member and President of Cements Division, 2018-2019.
- 7th Advances in Cement-Based Materials, July 2016 ACerS Cements Division conference, Program Chair.
- 11th Advances in Cement-Based Materials, June 2020 ACerS Cements Division conference, Program Chair (cancelled due to COVID-19).