



Matthew D. D'Ambrosia

Principal Engineer

Materials & Mechanics

Dr. D'Ambrosia has extensive experience in concrete materials behavior, including characterization of mechanical properties,

development of new experiments and numerical models and mixture optimization. He is an expert on Self-Consolidating Concrete (SCC) including mechanical performance, production, optimization, formwork pressure and durability. His other areas of expertise include early age volume stability, creep and shrinkage of high performance materials, fiber reinforced concrete, shrinkage reducing admixtures (SRA) and internal relative humidity. He also has experience instrumenting and monitoring structural and material behavior in concrete bridges.

Since joining CTLGroup, Dr. D'Ambrosia has specialized in solving difficult problems for the construction industry. His interests include materials optimization for specialized applications, durability-related mechanisms such as volume change and cracking, as well as new approaches to prediction and verification of service life, durability and sustainability. He has expertise with large infrastructure and energy projects throughout the US, such as bridges, highways, dams and power plants.

Dr. D'Ambrosia teaches numerous instructional courses for the industry and currently serves as Adjunct Professor in the Department of Civil and Environmental Engineering at Northwestern University.

Contact

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Credentials

▶ [Ph.D. in Civil and Environmental Engineering](#)

University of Illinois at Urbana-Champaign, 2011

▶ [M.S. in Civil and Environmental Engineering](#)

University of Illinois at Urbana-Champaign, 2002

▶ [B.S.E., with Honors and Distinction, in Civil and Environmental Engineering](#)

University of Iowa, 1999

Registration

▶ [Professional Engineer](#)

Illinois, Indiana

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Experience

▶ **High-Performance, Self-Consolidating & Fiber Reinforced Concrete**

Developed a fiber reinforced self-consolidating concrete (FRSCC) for internal reinforcement and blast resistance of a major bridge structure.

Characterized the early age volume stability and mechanical properties of rapid repair materials, high-performance concrete (HPC), concrete containing shrinkage-reducing admixtures (SRA) and self-consolidating concrete (SCC).

Developed experiments and numerical models to characterize early age constitutive properties, segregation and formwork pressure of self-consolidating concrete (SCC).

▶ **Creep & Shrinkage Behavior & Early-Age Volume Change**

Evaluated creep and shrinkage behavior for supertall buildings in Dubai, Abu Dhabi, Oman, Korea and Chicago.

Studied restrained shrinkage cracking, fatigue behavior and reinforcement bond strength of fiber reinforced, high-performance concrete for bridge deck and pavement applications.

Performed field instrumentation and monitoring of structural and material behavior in concrete bridge decks.

▶ **New Concrete Products & Advanced Cement Based Materials**

Provided consulting, research and product development services to the manufacturer of a lightweight concrete additive. Guided the manufacturer through the development of an ICC-ES Acceptance Criteria and Engineering Services report.

▶ **Moisture Transport & Internal RH**

Evaluated 3-D MRI for moisture transport assessment in concrete and masonry materials.

Assisted in development and implementation of internal relative humidity measurement system for use in concrete health monitoring.

▶ **Concrete Mixture Optimization**

Conducted mixture optimization, materials selection and testing for creep and shrinkage properties for a critical component of the containment structure for a nuclear power facility.

Provided consulting and developed performance criteria and optimized mass concrete mixture proportions for a critical Department of Energy nuclear research facility.

▶ **Performance Specification Development for Sustainable Infrastructure**

Developed performance-based specifications for large infrastructure projects and highway agencies.

Provided consulting to highway agencies for implementation of sustainable infrastructure solutions.

Directed durability investigations for highways and bridges and recommended testing protocol and repair materials for service life extension.

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Affiliations

- ▶ **American Concrete Institute (ACI)- Member**
 - Committee 209, Creep and Shrinkage in Concrete – Voting Member
 - Committee 231, Properties of Concrete at Early Ages – Voting Member
 - Committee 236, Materials Science of Concrete – Voting Member
 - Committee 237, Self-Consolidating Concrete – Associate Member
 - Committee 329, Performance Criteria for Ready Mixed Concrete - Voting Member
 - Committee 349, Concrete Nuclear Structures
 - 0A - Materials – Voting Member
 - ACI Illinois Chapter - Member
- ▶ **American Ceramics Society (ACerS), Cements Division – Member**
- ▶ **American Society of Civil Engineers (ASCE) – Member**
- ▶ **Expert Reviewer**
 - *ACI Materials Journal*
 - *ASCE Journal of Materials*
 - *RILEM Materials & Structures*
 - *ASTM Journal of Testing and Evaluation*
 - *Cement and Concrete Research*

Services

- ▶ **New Concrete Products & Advanced Cement Based Materials**
- ▶ **High-Performance, Self-Consolidating & Fiber Reinforced Concrete**
- ▶ **Concrete Mixture Optimization**
- ▶ **Creep & Shrinkage Behavior & Early-Age Volume Change**
- ▶ **Moisture Transport & Internal RH**
- ▶ **Service Life Evaluation & Concrete Durability**
- ▶ **Performance Specification Development for Sustainable Infrastructure**

Awards

- ▶ **Chester P. Siess Award for Scholastic Achievement and Promise for Research**
- ▶ **Frederic T. & Edith F. Mavis Memorial Fellowship**
- ▶ **APWA Dr. Emil Nigro Memorial Scholarship**
- ▶ **Harvey H. Hagge Concrete Scholarship**
- ▶ **Tau Beta Pi Engineering Honor Society**
- ▶ **Chi Epsilon Civil Engineering Honor Society**