

Derek X. Cong | Associate Principal



EDUCATION

- Central South University
 - Bachelor of Science, Geology, 1982
 - Master of Science, Petrology, 1985
- University of Illinois at Urbana-Champaign
 - Doctor of Philosophy, Geology/Materials Science, 1994

PRACTICE AREAS

- Petrography
- Concrete Durability
- Cement Hydration
- Mortar Evaluation
- Aggregate and Dimension Stone
- Construction Materials Assessment
- Litigation Consulting
- Research and Testing

PROFESSIONAL AFFILIATIONS

- American Concrete Institute (ACI), Central Texas Chapter
- ASTM International (ASTM)
- International Cement Microscopy Association (ICMA)
- Society of Concrete Petrographers (SCP), founding member and past president

CONTACT

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EXPERIENCE

Derek Cong has significant practical and theoretical experience with concrete and concrete materials. In over twenty-five years of practice, he has conducted thousands of investigations involving concrete, aggregate, masonry, stone, and other building materials. These investigations have included problems such as alkali-aggregate reaction (AAR), alkali-silica reaction (ASR), low strength, retardation, cement-admixture interaction, efflorescence, delamination, and other surface defects, fire-damaged concrete, cracking, sulfate attack, and delayed ettringite formation (DEF). He is often consulted on concrete mix designs to avoid concrete material problems.

During his doctoral studies at the University of Illinois at Urbana-Champaign, Dr. Cong conducted extensive research on cement hydration, structure of calcium silicate hydrate (C-S-H), and ASR using solid state nuclear magnetic resonance (NMR) spectroscopy. As a post-doctoral research associate for Lawrence Livermore National Laboratory, he performed hydrothermal synthesis of various model compounds for C-S-H. Prior to joining WJE, Dr. Cong held positions with W. R. Grace and the Erlin Company. He also taught optical mineralogy and petrography at Central South University in China.

REPRESENTATIVE PROJECTS

Petrography

- Seabrook Station - Seabrook, NH: On-site petrography and Damage Rating Index (DRI) determination for assessment of ASR-induced distress
- Wolf Creek Generating Station - Burlington, KS: Petrographic examination of concrete for ACR-induced cracking
- California Department of Transportation (Caltrans): Petrographic examination of concrete and aggregate samples for ASR Correlation Studies
- Sixth Street Bridge - Los Angeles, CA: Petrographic examination of ASR-deteriorated concrete cores
- I-5 Undercrossing - Santa Clarita, CA: Assessment of fire-damaged concrete

- World Trade Center - New York, NY: Petrographic examination of concrete cores for general properties of concrete
- Robert D. Moreton Building - Austin, TX: Petrographic and laboratory evaluation of concrete cores to assess the cause of cracking and predict the potential for DEF

Aggregate and Dimension Stone

- University of Texas at Austin, LBJ Presidential Library: Laboratory evaluations of granite panels
- LNG Tanks - Sabine Pass, LA and TX: Assessment of aggregate and concrete samples for various material properties from liquefied natural gas (LNG) tanks

Mortar Evaluation

- Camp Mabry - Austin, TX: Historical mortar evaluation and mix proportions
- Investigation of mortar mix proportions

Litigation Consulting

- GB Biosciences Corporation et. al. vs. Occidental Chemical Corporation, et. al - Houston, TX: Testimony on private arbitration regarding CFB ash samples
- Trinity Drywall Systems, LLC vs. TOKA General Contractors, Ltd., et. al. - Fort Worth, TX: Testimony regarding stucco problems
- Maisel Brothers, Inc. vs. Holcim (US), Inc. et. al. - Severna Park, MD: Technical and litigation support on the cause of concrete masonry unit block staining and pop-outs problems

Research and Testing

- Investigation of cementitious materials content and w/cm in hardened concrete
- ASR potential in concrete
- Quantitative determination of crushed carbonate in hardened concrete
- Petrographic techniques

TECHNICAL COMMITTEES

- ASTM C09 - Concrete and Concrete Aggregates
- ASTM C09.20 - Normal Weight Aggregates
- ASTM C09.50 - Risk Management for ASR
- ASTM C09.65 - Petrography