PERSONNEL QUALIFICATIONS

Marwa Abdelrahman | Senior Associate

EDUCATION

- Helwan University
  - Bachelor of Science, Civil Engineering, 2010
- University of South Carolina
  - Master of Science, Civil Engineering, 2013
  - Doctor of Philosophy, Civil Engineering, 2016

PRACTICE AREAS

- Bridges and Civil Infrastructure
- Service Life Modeling
- Nondestructive Evaluation
- Research and Testing
- Vibration and Noise Monitoring
- Laboratory Evaluations

REGISTRATIONS

- NACE Cathodic Protection Certified Technician

PROFESSIONAL AFFILIATIONS

- American Concrete Institute (ACI)
- American Society of Civil Engineers (ASCE)

TECHNICAL COMMITTEES

- ACI 222 - Corrosion of Metals in Concrete
- ACI 365 - Service Life Prediction
- ACI 444 - Structural Health Monitoring and Instrumentation

CONTACT

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EXPERIENCE

Marwa Abdelrahman's work focuses on the assessment of concrete material degradation, field investigation, and complex/large-volume data analysis. Her projects have included buildings, bridges, and industrial ports, as well as research and laboratory evaluations. Dr. Abdelrahman specializes in the condition assessment of in-service structures, concrete durability, service life modeling, and structural health monitoring.

Before joining WJE, Dr. Abdelrahman worked on research projects at the University of South Carolina, with a focus on assessment and monitoring of concrete degradation associated with corrosion of reinforcing steel and alkali-silica reaction (ASR). She presented and published her work on concrete material degradation and structural health monitoring in several technical societies, including ACI, PCI, and ASNT.

REPRESENTATIVE PROJECTS

Bridges and Civil Infrastructure

- Port of Houston Authority - TX: Element-level condition assessment and data analysis for multiple assets of different assembly and construction
- Third Avenue Bridge - Minneapolis, MN: Condition evaluation of historic concrete arch bridge for the Minnesota Department of Transportation; design-assist of cathodic protection system
- Mosaic Fertilizer Dock - St. James Parish, LA: Level I visual inspection of all dock structural, mooring, and berthing components
- Savannah River National Laboratory, 105 C Reactor Facility - Aiken, SC: Monitoring and assessment of corrosion damage in reinforced concrete members at a decommissioned nuclear facility *

Service Life Modeling

- Port of Houston Authority - TX: Service life evaluation for a wharf structure at the Barbours Cut terminal
- Interstate 480 Bridge - Omaha, NE: In-depth inspection, corrosion assessment, and service life modeling of bridge piers
- Chicago Transit Authority - IL: Durability design and service life modeling for various concrete and steel elements
- Samuel S. Baxter Water Treatment Plant - Philadelphia, PA: Service life modeling of precast/prestressed double-tee beams

Nondestructive Evaluation

- High-Rise Building - Chicago, IL: Condition assessment of post-tensioned slabs and concrete facade
- James K. Polk Building - Nashville, TN: Long-term acoustic emission and vibration monitoring of post-tension wire breaks
- ASTM C876 Half-Cell Potential Testing: Corrosion evaluation of offshore structures and bridge decks

Research and Testing

- Iowa Department of Transportation, Bridge Deck Preservation Portal Phase 1 - Poll-Funded Study: Development of a decision-making tool for selection and planning of maintenance actions
- Effect of substrate moisture on silane sealer effectiveness (WJE in-house research)
- Accelerated test to comparatively assess the performance of different discrete galvanic anodes (WJE in-house research)
- Self-Powered Wireless Sensor Network for Structural Bridge Health Prognosis - National Institute of Standards and Technology *
- Acoustic emission monitoring of ASR conducted in partnership with WJE *

Vibration and Noise Monitoring

- Southwest Florida International Airport - Fort Myers: Vibration consulting and monitoring services
- Iowa Department of Transportation: Condition assessments and vibration monitoring on projects in Des Moines, Fort Madison, Sigourney, and Pleasantville

** Indicates work performed while at the University of South Carolina*