

### Marwa Abdelrahman | Associate III



#### 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

#### PROFESSIONAL AFFILIATIONS

- American Concrete Institute
- American Society of Civil Engineers

#### TECHNICAL COMMITTEES

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

#### CONTACT

mabdelrahman@wje.com  
847.753.6382  
www.wje.com

#### EXPERIENCE

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

Prior to joining WJE, Dr. Abdelrahman worked on several 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. 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 - Houston, 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 Minnesota DOT; 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 - Houston, 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 DOT, 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 alkali-silica reaction (ASR) conducted in partnership with WJE\*

#### Vibration and Noise Monitoring

- Southwest Florida International Airport - Fort Meyers, FL: 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*