



Corporate Headquarters  
6521 Meridien Drive  
Raleigh, NC 27616  
O: (919) 755-1012  
info@fdh-is.com

[WWW.FDH-IS.COM](http://WWW.FDH-IS.COM)

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CONTACT: Ladson Brearley, PE  
Vice President, Commercial Management  
[ladson.brearley@fdh-is.com](mailto:ladson.brearley@fdh-is.com)

**FDH Partners with Marshall University Experts on Nondestructive Technology and Structural Health Monitoring Contract for Corps of Engineers**

RALEIGH, N.C. - FDH Infrastructure Services, LLC (FDH), has partnered with Marshall University on a multi-year contract with the Engineer Research and Development Center (ERDC), U.S. Army Corps of Engineers (USACE). The contract scope centers on the use of nondestructive testing (NDT) and structural health monitoring (SHM) technologies to characterize the lifecycle of embedded gate anchorages in large dams along navigable rivers.

The aim of the research is to develop a simplified method, and eventual product, that dam owners can use to predict the performance of steel anchor rods, along with remediation and repair strategies that impact lifecycle performance, resulting in lower maintenance costs and decreasing the potential for loss of life and property damage due to flood hazards. This research effort builds on work that the Marshall-FDH team had previously done for ERDC.

“Our partnership with Marshall University in support of the USACE has been very rewarding work,” says FDH CEO Greg McCray. “Our research is generating the inspection and monitoring products the USACE needs to perform predictive analyses of their structural assets and employ reliable remediation techniques that reduce costs, enhance safety, and extend the lifecycle of those assets.”

FDH’s role on the project is to perform the predictive analyses that identify potential failure modes, develop a simplified but robust tool for estimating the likelihood of failure, and demonstrate how NDT and SHM technologies can inform lifecycle performance.

Project principal investigator and team lead for Marshall University is Dr. Wael Zatar, professor, College of Engineering and Computer Sciences. The Marshall team will review relevant research and conduct laboratory testing to validate the numerical models in this study. Marshall will also investigate the factors contributing to stress corrosion cracking and identify maintenance and repair strategies and their expected impact on lifecycle performance.

Dr. Zatar notes, “This research uniquely examines the behavioral characteristics of anchor rods, providing dam owners with an exceptionally diverse tool for managing risk, as well as an enhanced understanding of the factors that contribute to performance deficiencies and failure.”

In addition to this study, FDH and Marshall are currently collaborating on research for the USACE to determine underwater inspection methods, including NDT techniques, to properly evaluate the condition of wood and steel pile foundations embedded in soil.

“Research partnerships such as this one assist in providing technological advancements and refined tools to improve the performance of large dams along navigable rivers while enhancing public safety,” says Dr. Matthew Smith, PE, research engineer at ERDC.

USACE has also contracted with FDH since 2009 to validate an NDT method using FDH’s proprietary dispersive wave technology to replace the costly and hazardous hydraulic lift-off test method for its inventory of large dams. Results have consistently shown FDH’s NDT solution to be accurate within  $\pm 3\%$  of the lift-off test method, significantly safer, and 10x faster, resulting in a 90% overall cost savings. This effort underscores FDH’s leadership in pursuing R&D that extends the lifecycle of critical infrastructure while reducing costs.

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#### **About FDH Infrastructure Services**

FDH Infrastructure Services, LLC, is an engineering, nondestructive investigation, structural health monitoring and construction services company that supports critical infrastructure markets. Headquartered in Raleigh, N.C, FDH offices are located nationwide and in London (U.K.). FDH professionals hold licensure throughout the United States and several U.S. territories. [www.fdh-is.com](http://www.fdh-is.com)