

Levee Systems Management Reduces Flood Risk to Communities



Innovative levee engineering to protect our communities and infrastructure assets.

Areas of Expertise

- Risk Assessment and Management
- Issue Evaluation Studies
- System Integrity
- Inspections and Field Investigations
- Levee and Flood Management Structure Design

More Information

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AECOM completed inspections on the flood damaged New Orleans East Levee System including earthen levees and floodwalls and then provided detailed analyses and construction services for \$250M in repairs within a nine-month period.

Overview

Reducing risks to our communities from rising water levels is critical in coastal and flatland areas. These regions are often subject to emergency flood events and need proven solutions for recovery.

For more than 60 years, AECOM (and our legacy firm URS) has been involved with all aspects of flood management levee systems, including field inspections, flood damage emergency response, storm damage assessment, risk assessment, feasibility studies, engineering and design, geotechnical evaluations and construction services. AECOM is familiar with the stringent U.S. Army Corps of Engineers (USACE) post Hurricane Katrina criteria as well as industry standards.

AECOM has developed a global perspective assisting national and international clients, including federal and local governments, to inspect, assess and design and construct a variety of levee and flood management systems. Included are floodwalls, floodgates and the structural features of the flood protection system.

We address challenges by creatively evaluating the situation, developing the right approach and delivering projects to benefit our clients' vision.

- **Understanding the risks associated with levee systems.** AECOM provided designs for levee and floodwall improvement projects and construction oversight throughout the New Orleans area in the post-Katrina recovery. Noteworthy were the designs of Lake Ponchartrain and Vicinity (LPV) 109 and LPV 111, seven and five miles of levee protection respectively. Unique to LPV 109 was the effective use of wick drains to reduce settlement and increase soil shear strengths. LPV 111 levee sections were supported on deep soil mixing columns. Additionally, AECOM's construction arm



built LPV146 in St. Bernard Parish. The project added 39,965 feet of HPile supported concrete T-walls constructed atop existing levees and raised the level of protection from elevation of 20.0 feet to 29.0 feet, thereby reducing the vulnerability of potential surge elevations and wave heights. In addition, in 2014 AECOM completed an award winning risk evaluation of 415 miles of urban levees for the California Department of Water Resources (DWR). The study enables DWR to prioritize and counsel local levee and reclamation districts regarding necessary remediation to achieve 200-year protection in the Central Valley, thus preventing catastrophic flood damage.

- **Technology provides quantifiable data to aid in project prioritization.** AECOM used electro-magnetic survey on hundreds of miles of the Urban Levee Investigation Program for California DWR to identify anomalies and buried or abandoned pipelines under the levees. LiDAR survey was used to quickly obtain topographic mapping of the levees and surrounding terrain to support future analyses and design efforts.

Areas of Expertise

- **Risk Assessment and Management.** AECOM offers a range of analytical tools and toolboxes developed in-house and with input from various clients' dam and levee safety boards. We provide risk and uncertainty analysis associated with levee integrity and consequence assessment including economic and ecosystem impacts, probable life loss and environmental and cost benefit analysis.
- **Perform Evaluation Studies.** The nature of safety issues and the urgent need for action requires a comprehensive approach. AECOM has led both small and simplified to large and complex Issue Evaluation Studies for various federal and private entities. These Issue Evaluation Studies have included risk assessments, field investigations, material characterizations, engineering analyses such as seepage and filter evaluations, stability, liquefaction, dynamic deformation, structural response and hydrology and hydraulic analyses.

- **System Integrity.** To protect our resources—including citizens, infrastructure, land, water supply and agriculture—against long-term impacts, our engineers analyze levee and flood wall integrity. A thorough understanding of the system resiliency is an essential factor in assessments. AECOM's engineering staff includes experts able to analyze a variety of components integral to levee/flood protection systems such as: levees, T-Walls, I-Walls, gates and other flood control structures.
- **Inspections and Field Investigations.** AECOM provides inspections related to: levees, floodwalls, gates and structures, pumping station systems, locks and dams and emergency response and storm damage assessments. We also offer extensive capabilities completing geophysical surveys and remote sensing, electromagnetic surveys and LiDAR, geology and geomorphic studies and field investigations and in-situ testing.
- **Levee and Flood Control Structure Design.** Expertise combined with a proven quality process ensures systems perform as designed. AECOM has decades of experience in the design of floodwalls, levees and structures including floodgates, pump stations, diversion channels, weirs and flood detention basins. Expertise includes:
 - Instrumentation installation and studies
 - Data management and GIS
 - Integrated GIS and CADD platforms
 - Web-based monitoring systems
 - Project websites
 - Early warning system inspections and designs
 - Repair under PL84-99 for federal flood control projects
 - Construction
 - Operation and maintenance support
 - Engineering, analyses and modelling

Our staff work closely with federal agencies including the USACE, Natural Resources Conservation Service and Federal Emergency Management Agency to evaluate and certify weirs, dams, pumping stations and other flood control structures.