

Dam and Levee Engineering

Since 1958, GAI Consultants has designed and inspected hundreds of dams, levees, and residual waste impoundment dikes for private and government owners—many regulated by the Federal Energy Regulatory Commission (FERC).

Seasoned professionals with a library of knowledge on dam foundations means owners have a valued partner in keeping dams operating safely.

GAI's services for soil, rock, mine tailings, concrete dam structures, and dam conversions include instrumentation and installation design, and monitoring for pore water pressures and slope movement. Skilled geotechnical engineers conduct EPA-mandated inspections and structural integrity evaluations, and certify existing Coal Combustion Residuals (CCR) disposal impoundments.

GAI evaluates dam and reservoir sites by studying hydrologic balance and geotechnical conditions in

the area. We assess economic and environmental impacts from facility construction and operation, and use advanced computer programs to analyze water quantity and quality, evaluate historical rainfall and streamflow, and determine probable maximum precipitation and runoff. Our subsurface investigations reveal foundation soil and rock characteristics, underlying leakage and aquifer recharge potential, faults, and borrow material.

GAI's dam professionals are a library of knowledge on dam foundations in simple, flat-lying strata; complex, fractured and folded strata; and metamorphic rock in cavernous limestone, sandstone, claystone, shale, schist, phyllite, and granite bedrock. Understanding that some sites in karst areas or overlying mines require special treatment, we analyze site-specific seismic risk when designing dams and appurtenances.

The success of a dam project rests on the type of comprehensive quality control testing that GAI provides during construction projects. Using



gai consultants®

Service Profile



sophisticated testing methods, we evaluate soil, rock, and concrete construction materials on-site while monitoring construction; and design and monitor installation of sophisticated instrumentation systems to evaluate post-construction performance. Our piezometer installations reach depths over 400 ft, establish survey control, and record movement.

GAI's dam structure stability analyses evaluate the behavior of earth, rockfill, and coal waste embankment slopes under varying conditions. Our inspections cover hydrologic, hydraulic, and stability assessments, structural evaluations, geologic reviews, and operation and maintenance program evaluation.

Dam and Levee Engineering Services

- Structural and hydraulic analysis and design
- Geotechnical and foundation investigations
- Site, economic, and hydraulic feasibility studies
- Hydraulic and embankment analysis and design
- Spillway hydraulic design and remediation
- Seismic analyses, and stability and seepage analysis
- Spillway and outlet works design

With advanced computer analysis capabilities, GAI creates inundation maps for Emergency Warning Plans that establish coordination and communication measures for protecting downstream residents in the event of an emergency. We also help dam owners with staff training on the fundamentals of dam inspection and safe maintenance and operation measures.

GAI is diligent in providing inspection, design, and training services that promote safe operation of the dams, levees, and residual waste impoundments vital to our nation's economy. We are proud to contribute to their safe and efficient operation.

- Instrumentation design, installation, monitoring
- Maintenance and operation plans
- Failure/flood inundation analysis and mapping
- Emergency warning/action plans
- Inspection and safety training
- Construction monitoring
- Inspection and materials testing

GAI Services Summary

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| <ul style="list-style-type: none"> ■ Airport Planning and Design ■ Bridge and Structure Inspection and Design ■ Coal Combustion Residuals Management ■ Construction Inspection and Management ■ Cultural Resources Management ■ Economic Analyses and Strategies ■ Electric Transmission Design and Siting ■ Environmental Engineering ■ Environmental Studies, Species Studies, Permitting ■ Gas Pipeline Surveying and Mapping ■ Geographic Information Systems (GIS) ■ Geotechnical Engineering and Geology | <ul style="list-style-type: none"> ■ Impoundment and Landfill Permitting and Design ■ Land Development Engineering ■ Landscape Architecture and Design ■ Master Planning and Urban Design ■ Mechanical, Electrical, Structural Engineering ■ Natural Gas FERC Certification and Permitting ■ Nuclear Energy Engineering Support ■ Right of Way and Appraisal Support ■ Land Surveying and Mapping ■ Transportation Planning and Design ■ Utility Management Consulting ■ Water, Stormwater, Wastewater Management |
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The scope of professional services that are provided by or offered out of each GAI office including, but not limited to, engineering and surveying services, is governed by the professional and business licensing requirements of each individual State or jurisdiction in which the GAI office is located and whether GAI has the requisite professional and business licenses for that State or jurisdiction. Nothing on GAI's Web Site or marketing materials is intended to be interpreted or construed as offering to perform professional licensed services where prohibited unless the licensing requirements have been met. Engineering services are not offered out of GAI's Northern Kentucky (Florence) office location. Surveying services are not offered out of GAI's Illinois location or by our New York subsidiary.