

FREDRICK J. WENTZ, JR., G.E.
Geotechnical Engineer

EDUCATION

University of California, Berkeley, M.S., Civil Engineering, 1991
California State Polytechnic State University, San Luis Obispo, B.S., Civil Engineering, 1988

REGISTRATIONS AND CERTIFICATIONS

California Registered Civil Engineer (No. C 51234)
California Registered Geotechnical Engineer (No. 2581)
OSHA 40-hr Health and Safety
Mine Safety and Health Administration (MSHA) Experienced Miner
Radiation Safety Officer
Nuclear Density Gauge Operator

AFFILIATIONS

American Society of Civil Engineers (ASCE): Member Grade
American Council of Engineering Companies - California
International Society for Soil Mechanics and Foundation Engineering
Geo-Institute
Chi Epsilon, National Civil Engineering Honor Society

EXPERIENCE

Mr. Wentz has more than 20 years of experience in geotechnical engineering, earthwork construction and geotechnical testing and inspection. Prior to starting a geotechnical consulting firm in 2005, Mr. Wentz worked for much of his career at URS Corporation (formerly Woodward-Clyde Consultants) and Stone & Webster. He has a wide range of project experience including earth- and rockfill dam design, seismic safety evaluation of earth- and rockfill dams, shallow and deep foundation design, underground pipelines, numeric modeling and analysis of complex geotechnical problems, liquefaction hazard evaluation, landslide evaluation and repair, construction engineering and forensic evaluations.

Mr. Wentz has conducted geotechnical field investigations and performed geotechnical design and analysis for various projects in including dams, power plants, pipelines, hospitals, schools, light industrial and residential developments. Noteworthy project experience includes engineering design and construction support for one of South America's largest mine tailings storage facilities; foundation design for the \$1 billion construction of the Getty Museum and Funicular Rail System near Los Angeles, CA; and lead geotechnical engineer for design of a \$1.8 billion NRC-licensed plutonium processing facility.

REPRESENTATIVE PROJECTS

Upper Alamo Creek Detention Basin, Solano County, CA

Geotechnical investigation for a new 1,000 acre-foot storm water detention basin for City of Vacaville. The design included approximately 5,000 feet of embankment up to about 30 feet high and excavations up to about 15 feet deep. The exploration program included borings to a depth of 90 feet; and Cone Penetration Testing (CPT) to a depth of 80 feet. The project included coordination with and design review by California Division of Safety of Dams (DSOD).

Kennecott Tailings Impoundment, Salt Lake City, UT

Lead geotechnical engineer in effort to model the effect on foundation seepage of raising one of the United States' largest mine tailings impoundments. Responsibilities included characterizing the geotechnical properties of several hundred acres of land, developing a numerical seepage model of the tailings impoundment and surrounding vicinity, and calibrating the model with observations of groundwater levels from numerous observation wells.

South Fork Tolt River Project, WA

Performed static and seismic stability analyses on a 200-foot-high, 1,000-foot-long earthfill dam and two smaller earthfill dams as part of a FERC relicensing application. Responsibilities included: characterizing embankment and foundation material properties; numerical deformation analyses of embankments; numerical soil-structure interaction analysis of morning glory spillway; static and pseudostatic slope stability analyses of embankment; and designing dam foundation improvement program utilizing stone columns to mitigate risk of earthquake-induced failure.

Quebrada Honda Tailings Storage Facility, Toquepala, Perú

Project Engineer for siting and feasibility studies and final design for 900 million cubic meter tailings storage facility. Responsibilities included: developing scope of work for geotechnical field investigation program (800 meters of diamond drilling); supervising field investigation program; characterizing foundation and embankment borrow materials; evaluating mine tailings for suitability for cycloning; conducting fatal flaw analyses; developing engineering properties for final design. Directed seepage, seismic and static deformation and stability analyses for embankment design. Developed recommendations for embankment construction and cyclone operations.

Project Engineer during preparation of construction drawings and technical specifications for an 1,800-m-long, 58-m-high compacted earthfill starter dam; 3,900-m-long, 125-m-high cyclone sand embankment; cyclone system to handle 115,000 tons per day of tailings; 8,000-m-long concrete tailings conveyance channel; and 29,000 gpm decant water return system. Developed QA/QC field and laboratory programs for embankment construction. Served as Resident Construction Engineer during construction of starter dam and tailings conveyance system.

Wanapum Dam, WA

Developed and supervised geotechnical investigation to determine cause of settlement of the crest of a 35-year-old, 80-foot-high earthfill embankment dam spanning Columbia River. Field exploration program consisted of mud-rotary drilling and cone penetration testing. Developed material index and engineering properties for embankment and performed numerical modeling of the embankment to evaluate embankment settlement. Work was conducted in support of a FERC Part 12 safety evaluation.

Mud Lake Dam, Gardnerville, Nevada

Developed and performed geotechnical foundation investigations to site a 60-foot-high, 200-foot-long rockfill dam (design-build project). Performed borrow source characterization for embankment construction. Designed zoned rockfill dam and performed supporting geotechnical evaluations including static and seismic embankment stability analyses, and seepage analyses. Served as Resident Engineer during embankment construction.

La Granja Water Management Project, Perú

Project Manager for feasibility design to provide fresh water to new open-pit copper mine and concentrator and to divert two major streams away from open-pit. Directed feasibility design of 110-m-high roller compacted concrete (RCC) dam, 90-m-high concrete-faced zoned rockfill dam, 18 kilometers of large concrete open-channel diversions and six kilometers of diversion tunnels. Responsibilities included: developing scope of work for geotechnical field investigation (500 meters of diamond drilling); supervising field investigation; developing geotechnical laboratory testing program; developing geotechnical material properties for analysis and design of various project elements; developing and evaluating various design concepts; preparing feasibility-level design drawings; and developing engineering cost estimates.

Rio Canete Hydroelectric Project, Perú

Project Engineer/Deputy Project Manager for siting study, feasibility study and preliminary design of hydropower project. Developed scope of work for geotechnical and geological field investigations for siting 12 earthfill dams up to 120 feet high, and one 600-foot-high roller compacted concrete (RCC). Coordinated and supervised field investigations and developed geotechnical laboratory testing programs. Developed/analyzed various designs for dams and performed geotechnical analyses for seepage, settlement and static and seismic stability. Developed preliminary design drawings and engineering cost estimates for dams. Prepared matrix evaluation of cost versus water storage and power generation alternatives for presentation to Owner.

Mixed Oxide (MOX) Fuel Fabrication Facility, Savannah River, SC

Lead geotechnical engineer for NRC-licensed \$1.8 billion project to convert weapons-grade plutonium to nuclear fuel rods. Work for project included 8-week geotechnical site investigation including soil borings, cone penetration testing (CPT) and downhole seismic surveys, site response analyses, liquefaction analyses and development of dynamic soil properties for soil-structure interaction (SSI) analyses. Supervised 2-D finite element (FLAC) modeling and analysis of static and dynamic deformation of foundations. Developed and supervised \$140,000

geotechnical laboratory testing program to determine static and dynamic soil properties for use in design.

Centralia Power Plant, Centralia, WA

Performed foundation design for addition of gas scrubbers and new 200-foot-high exhaust stack for 500-megawatt generating plant.

Cordova Energy Center, Cordova, IL

Conducted field geotechnical investigations, developed laboratory testing program, and performed engineering analyses for design of building and turbine foundations for 550-megawatt combined-cycle generating plant.

Getty Museum, Los Angeles, CA

Foundation design for multi-level buildings and a Funicular Rail System supported on large-diameter caissons for \$1 billion museum project.

Port of Oakland, Oakland, CA

Performed stability analyses of retaining walls up to 20 feet high, and foundation design for multi-level buildings and a funicular rail system supported on large-diameter caissons all located in a highly active seismic environment.

Ophir Water Treatment Plant, Newcastle, CA

Geotechnical investigation for 60-million-gallon per day water treatment plant. Project included 25-foot-deep excavations for buried reservoir structures, and retaining walls up to 30 feet in height. The work also included an investigation to identify historic mines that might be located across the site, and development of mine mitigation measures.

Co-Generation Plant, Lincoln, CA

Supervised geotechnical investigation and analysis for a new turbine, generator, condenser and ancillary facilities. The project also included the relocation of an existing sub-station and re-routing the power transmission lines to the new location.

Deer Creek Waste Water Treatment Plant, Shingle Springs, CA

Geotechnical investigation for \$15 million expansion of waste water treatment plant for El Dorado Irrigation District. Project included deep excavations adjacent to existing structures, shallow groundwater, and both soft ground and hard rock excavation.

Project 184, El Dorado County, CA

Various geotechnical investigations, slope stability evaluations and stream channel studies conducted for El Dorado Irrigation District hydro-electric project. The work was performed as part of general operations and maintenance projects, as well as in support of FERC re-licensing of hydro-electric project.

Open Reservoir Replacement Program, El Dorado County, CA

Geotechnical investigations for several water storage tank sites as part of a program by El Dorado Irrigation District to replace open reservoirs with covered storage.

Utica Power Authority Flume Replacement, Calaveras County, CA

Geotechnical and geologic studies for reconstruction of UPA's Flume 14 and ¾-mile Flume which were destroyed in October, 2001 by the Darby Fire. Project consisted of replacing nearly 2 miles of historic wooden flumes traversing rugged, steep terrain. Replacement flume superstructures consisted of both wood replicas of the original construction and (on very steep ground) long-span steel construction. Served as Field Engineer during construction of the project.

Kaiser Medical Center, Phase I, Vacaville, CA

Geotechnical investigation of a previously undeveloped 50-acre site for new 2-story hospital, 3-story medical building and a utility plant building. Investigation included a liquefaction evaluation and development of site-specific seismic response spectra.

Sewer Interceptor, Portland, OR

Geotechnical Investigation for 4-mile-long sewer interceptor with multiple street, water and rail crossings and several deep vaults. Major project elements included temporary shoring of deep excavations adjacent to existing buildings and an interstate highway, underpinning of bridge foundations, and boring and jacking of a 36-inch-diameter pipeline beneath a major street intersection.

PUBLICATIONS

Wentz, Jr., Frederick J., and James K. Mitchell (1991). "*Performance of Improved Ground Sites During the Loma Prieta Earthquake*," Report No. UCB/EERC-91/12, Earthquake Engineering Research Center, University of California, Berkeley.

Wentz, Jr., Frederick J., and James K. Mitchell (1992). "*Improved Ground Performance During the Loma Prieta Earthquake*," Geotechnical News, Volume 10, Number 3.