

# Mud Mountain Dam Right Bank Stability Correction

White River, Washington

**Owner:** USACE, Seattle District

**Description:** INCA Engineers, Inc., A Tetra Tech Company (INCA) prepared engineering studies and plans, specifications and estimates to stabilize the portion of the right dam abutment that supports the pedestrian access bridge to the air vent shaft at Mud Mountain Dam.

INCA performed the following tasks:

- ▶ Analyzed the stability of the pier foundation for the pedestrian access bridge.
- ▶ Analyzed the stability of the earth slope in the vicinity of the pedestrian access bridge for shallow and deep seated slope factors of safety against sliding.
- ▶ Designed a new water supply pump house.
- ▶ Provided structural stabilization improvements to stabilize the pedestrian bridge pier.
- ▶ Provided grading options for slope stabilization, including an access road to the bridge pier.
- ▶ Provided topographic surveying.
- ▶ Modified the lifelines from the landward end of the pedestrian bridge to stable ground.
- ▶ Prepared a grading and erosion control plan for the stockpile created from the mass excavation (approximately 160,000 c.y.).
- ▶ Relocated the steel water tanks used to flush the control gates for the dam.
- ▶ Designed all seismic elements to the Maximum Credible Earthquake.
- ▶ Provided contract documents and construction management services.
- ▶ Removed and provided temporary routing of underground electrical utilities, including medium voltage and fiberoptic cables, lighting and control circuits, and routing of new electrical utilities.

In conjunction with the slope stabilization and grading work, INCA designed new domestic water, fire supply, and intake tower flushing water systems to replace existing services demolished during new construction. This work included the preparation of plans and specifications for three new 50,000-gallon water tanks, three new pipelines, thrust restraint systems, air release/vacuum valves, and appurtenances. INCA evaluated alternative thrust restraint options for the water pipeline across the service bridge equipped with seismic motion couplings; designed new sub-drainage and drainage systems for re-graded abutment; and prepared plans and specifications for new sub-drains, filters, and HDPE drain line on steep slopes.

INCA surveyors provided mapping for stability correction design showing existing slope conditions and planimetric features. All work was tied to the Mud Mountain Dam horizontal and vertical control network. The project involved work on steep slopes with specialized safety equipment and measurement of overburdened material stock pile areas.

