

ROCKY REACH FISH PASSAGE ENGINEERING PROTOTYPE AND PERMANENT

EES Consulting staff has served as the lead mechanical and electrical engineering consultant to Chelan County Public Utility District No. 1 and CH2MHill for the Design and Construction of the juvenile downstream fish passage facilities at the Rocky Reach Hydroelectric Project.

This project was a decade-long effort by Chelan County Public Utility District No. 1 to enhance salmon and steelhead fish passage at its Rocky Reach Dam. Improvement in fish passage at Rocky Reach was mandated by a Habitat Conservation Plan, which required a fish passage system that would cause “no net loss” in the fish populations passing through the project. A major component of the enhancement program was improving survival of juvenile fish passing the dam by providing a system to guide fish away from the



Rocky Reach Powerhouse turbines and convey them safely downstream. Prototype facilities included submerged turbine intake screens, intake gatewell collection systems and a surface collector in the powerplant forebay. In 1997, the prototype system was modified to improve hydraulic and biological performance, and was tested to determine a functional arrangement for the permanent facilities. In 1998, a second fish collection entrance was added, with automated flow control and cleaning equipment. Further modifications in 1999 included a moveable entrance wall on the second fish entrance. EES Consulting staff were retained by the lead design consultant to design pumping systems, gates, wall floatation systems, power, controls and system instrumentation. These included a 500 cfs capacity pump station for dewatering of the secondary fish screen, gates for control of downstream bypass flows, level sensors, electrical controls, screen cleaners, and instrumentation for the overall system.

The permanent juvenile fish bypass system was designed from 2001 to 2002 following 7 years of operating various prototype systems. The permanent system was constructed under extreme schedule constraints between the 2002 and 2003 fish migration seasons. Between September 2002 and March 2003, the existing prototype system (approximately 3 million pounds of submerged metalwork) was demolished, and the permanent bypass facility was constructed. It consists of 3 major systems, a Surface Collector, an Intake Screen system and a Bypass Conduit. The surface collector includes a 6000 cfs fish entrance structure, a 5700 cfs rated dewatering screen, 6000 cfs pump station, trash rakes, screen cleaners, and PLC-based control system. The intake screen system includes two complete turbine intake screens for powerhouse units 1 and 2, along with screen cleaners, 12 weir control gates, conveyance piping system and PLC controls. The bypass conduit includes a 4800 foot long conveyance conduit rated for 360 cfs, using pipe and flume up to 108 inches in diameter, a fish sampling screen, an evaluation facility, and PLC control system.

EES Consulting served as the mechanical/electrical design and construction management subcontractor to CH2M Hill (the program management firm). As part of the design and development team, EES Consulting provided concept development, detailed design, specifications, shop drawing review, shop inspection, field inspection, startup assistance, O&M manual preparation support and as-built document preparation to CH2M Hill and the District.