

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT <i>(Present as many projects as requested by the agency, or 10 projects, if not specified. (COMPLETE ONE SECTION F FOR EACH PROJECT.)</i>		20. EXAMPLE PROJECT KEY NUMBER	
21. TITLE AND LOCATION (CITY AND STATE) Swinging Bridge Penstock Remediation Sullivan County, New York		22. YEAR COMPLETED PROFESSIONAL SERVICES 1994 – 2001 CONSTRUCTION (IF APPLICABLE) 1995	
23. PROJECT OWNER'S INFORMATION			
a. PROJECT SPONSOR Orange & Rockland Utilities, Inc.	b. POINT OF CONTACT NAME John Haggarty	c. POINT OF CONTACT TELEPHONE NUMBER (845) 577-3700	

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)

Swinging Bridge Dam is a component of the Mongaup River Basin Hydro Project in Sullivan County, New York (FERC Project No. 10482-NY). This earthen embankment Dam was constructed in 1927 using semi-hydraulic fill construction techniques. The Dam spans across the Mongaup River and is equipped with two hydroelectric generating units. A 14-foot wide concrete Tunnel Structure runs the entire cross-section of the Dam and includes a 10-foot diameter steel-lined Penstock and a 9-foot square access tunnel. Leakage into the access tunnel and a rupture in the Penstock liner was noted during an annual FERC inspection. RIZZO was retained by Orange and Rockland Utilities, Inc. (ORU) to perform settlement and buckling analyses of the Penstock, and static and dynamic stability analyses for the Dam.



A FERC approved work plan for field investigation was implemented by RIZZO including drilling of borings, and installation of piezometers for monitoring seepage through the Dam. SPTs were recorded and undisturbed thin-wall tube samples were recovered for laboratory testing. Settlement analyses of the tunnel structure calibrated the analytical model with respect to recorded settlements in 1930.

The model was utilized in estimating deformations, bending moments, and shear forces and stresses in the Penstock liner for use in the buckling analyses.



Piezometer data was evaluated and contours of equipotential head within the Dam were developed for use in static and pseudo-static slope stability analyses. A reservoir refilling program was developed by RIZZO which describes the schedule for monitoring the piezometers during reservoir refilling so that the responsiveness of the piezometers can be evaluated. This refilling program was approved by the FERC.

In addition to the engineering evaluation, a grouting program was developed utilizing both cement based and chemical grout to reduce leakage into the observation tunnel and seal settlement cracks in the concrete Penstock. Pressure relief holes were drilled below the bulge and the Penstock liner was repaired.

In 2001, RIZZO performed a follow-up evaluation of the settlement data and performed another Penstock inspection. A report was prepared documenting acceptable performance of the remediated Penstock and was submitted to the FERC.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT		
a.	(1) FIRM NAME: RIZZO Associates	(2) FIRM LOCATION (City and State): Tarrytown, NY (3) Role: Settlement and Buckling Analyses of the Penstock and Dynamic Stability Analyses for the Dam

