

**East/West Portal
Alameda Siphon No. 4
Engineering/Project Management Survey
Sunol, California**

I. Survey Respondent:

Name: Eric Gee, Construction Manager

Presenter:

Name: Ramon Garcia, Senior Engineer

Name: Eric Gee, Construction Manager

II. Project to be discussed at this site:

The major construction activities for a fourth seismically designed pipeline and other improvements for the Alameda Siphon No. 4 project are now complete. Crews completed the installation and in-service testing of the instrumentation, control and security system for the project as well. This project, completed in 2012, ensures the water system performs properly and water can be delivered to customers after an earthquake.

The project is part of the San Francisco Public Utilities Commission (SFPUC) \$4.8B Water System Improvement Program (WSIP) to repair, replace, and seismically upgrade our facilities from the risk of earthquake damage. There are 83 projects including: pipelines, tunnels, dams, reservoirs, pump stations, storage tanks, and treatment facilities. Over 85 percent of the WSIP projects are completed.

III. Purpose of the project in relation to system performance objectives:

1. Provide system redundancy and to withstand a major earthquake (magnitude 6.8) on the Calaveras Fault with the following objectives to meet LOS seismic goals:
 - Minimum flows required within 24 hours: 120 MGD
 - Minimum flows required within 30 days: 160 MGD after a major earthquake on the Calaveras, Hayward or San Andreas Faults.
2. Provide equal blending of Hetch Hetchy and local waters in the existing and future Irvington Tunnels.

IV. Description of what was built, or is being built:

The Alameda Siphon No. 4 Project extends approximately 3,000 feet from the Alameda East Portal across both the Calaveras Fault and Alameda Creek to the Alameda West Portal.

The project consisted of:

- A 66-inch diameter welded steel pipeline with 310 feet of a seismically designed special trench thicker-walled pipe in the fault rupture zone, and a tunnel crossing under Alameda Creek
- A 96-inch diameter "blending structure" that consists of a pipe and valve manifold near the Alameda West Portal that will blend water from the Sunol Valley Water Treatment Plant and Hetch Hetchy, so the existing and new Irvington Tunnels will receive a uniform quality of water
- Other ancillary project components include the following: new valves on the existing siphons, ventilation improvements, chemical injection facilities, overflow pipe, road improvements at the intersection of Calaveras Road for construction access, and improvements to the bridge crossing Alameda Creek

V. Engineering/Project Management/Environmental Challenges in Design, Construction, Testing, and Implementation:

- a) CEQA Boundary did not coincide with the project's established construction limits
- b) Installation method of pipeline underneath Alameda Creek
- c) Tunneling: Geotechnical report not representative of actual conditions
- d) Dispute Review Board
- e) CMIS
- f) Working in gassy tunnel environment
- g) Requests from "Owners" after construction started

VI. Lessons Learned from an Engineering/Project Management Perspective:

- Need for more investigations during design to locate existing facilities and prepare a better geotechnical baseline report
- Partnering and good relationships were very important when the tunnel-boring machine became stuck. Many people worked quickly and effectively to come up with solutions and plans for action