

## **How Design/Build at Pine Brook Dam Dramatically Reduced Schedule and Costs**

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**SYNOPSIS.** The design/build approach has been successfully used to expedite the design and construction process of many heavy civil construction projects, including bridges, highways, and multi-story buildings. One of its first applications for design/build in dams began when the Pine Brook Water District – a small water district serving only 400 taps or about 1200 customers, located two miles northwest of Boulder, Colorado (USA) – sought to build a new dam with an extremely aggressive schedule and budget. Given these constraints, Pine Brook believed a design/build approach was the only viable method to design and construct this new roller-compacted concrete (RCC) dam.

The design/build team implemented a process involving the owner, engineer and contractor at the earliest phases of the project. Geotechnical aspects, flood hydrology, RCC mix design, dam layout and constructability, seepage cutoff and collection, outlet works, instrumentation, construction schedule, and even aesthetics were evaluated by the entire team. This integrated team was able to quickly address issues and focus on preferred design elements without commissioning costly studies evaluating a myriad of alternatives. Design and construction were completed in only 18 months.

At the conclusion of the project the team believed they had saved considerable time and money, but comparing dam projects is difficult. The Genesee Dam in Colorado – a virtually a twin to Pine Brook in nearly every design aspect – was completed one year later at a cost nearly twice that of Pine Brook. The comparison of these two dams is a perfect illustration of the financial impacts of these innovations and is discussed with this paper.