

# Rueter-Hess Dam and Reservoir to Solve Water Shortage Problems<sup>1</sup>

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Rueter-Hess Dam and Reservoir project is located 3 miles (4.8 km) southwest of the Town of Parker, Colorado on Newlin Gulch, which is a tributary drainage of Cherry Creek. An estimated 240,000 yd<sup>3</sup> (183,500m<sup>3</sup>) of soil-cement will be used to complete the upstream slope facing of the earthen dam and about 50,000 yd<sup>3</sup> (38,000 m<sup>3</sup>) for the auxiliary spillway. The proposed 196 feet (60 m) high dam will create about 72,000 acre-feet (8,900 hectare-m) of water storage. Built for the Parker Water and Sanitation District (PWSD), the reservoir will serve the current water needs and solve long-term water supply and management challenges.

The Rueter-Hess project consists of an earthen dam, a water diversion structure on Cherry Creek and a pump station and pipeline to carry surface water from Cherry Creek to Rueter-Hess Reservoir. The project employs a water management system that captures surface water, especially storm runoff that normally would be lost down-stream. When complete, the project will reduce the area's reliance on groundwater and pumping water from underground aquifers.

Designed by RJH Consultants, Inc. of Englewood, Colorado, the project originally was envisioned to be built as a 135-foot (41-m) high, 5,300-foot (1,615-m) long earthen dam that would impound approximately 16,200 acre-feet (2,000 hectare-m) and inundate approximately 470 acres (190 hectares). But since construction began in 2004, the communities of Castle Rock, Castle Pines North and Stonegate have requested storage at Rueter-Hess. This added need for storage capacity has accelerated the need to enlarge the dam and will increase the surface area of the lake from 470 water surface acres (190 hectares) to 1,170 water surface acres (473 hectares) and expand the dam height to 196 ft (60 m).

Phase I of the project including building the 135-foot (41-m) high earthen dam has been completed. The construction manager was Weaver General Construction;



**Rueter-Hess Dam under construction in November 2006 .  
(by Jackie Shumaker Photography)**

Sema Construction handled the earthwork; Gears, Inc. constructed the soil-cement slope protection; Ames Construction built the outlet works; and Hayward Baker installed the curtain wall grouting.

The slope at the upstream face of the 135-foot (41-m) high dam ranged from 3H:1V to 4.25H:1V. Flatter slopes received two layers of soil-cement built using plating construction method whereas steeper slopes were covered with soil-cement using stair-step construction method. Project specifications called for soil-cement thickness of 2 feet (0.6 m) as measured perpendicular to the slope. A series of soil-cement mix designs and a field test section were performed prior to starting soil-cement placement. Testing performed included aggregate gradation, moisture-density relationship, compressive strength, and durability tests. Based on the test results, correlations between compressive strength and durability were developed and a minimum of 500 psi (3.4 MPa) compressive strength at 56 days was selected for the project.

Approximately 73,000 yd<sup>3</sup> (56,000 m<sup>3</sup>) of soil-cement were used in Phase I. Soil for the soil-cement was obtained from



**Plated soil-cement and on-site soil-cement mixing plant.**

approved borrow areas located within the proposed reservoir basin. To meet the compressive strength requirement, a cement content of 9 percent by dry weight of soil was selected. Portland cement Type I/II was used. Gears, Inc. mixed the materials using an Accumix 750 XB continuous pugmill. The soil-cement facing was built in about 12 weeks from mid August to early November, 2006. The total cost of in-place soil-cement was \$38/yd<sup>3</sup> (\$49.70/m<sup>3</sup>). This cost included cost of materials, mixing, transporting, placing and curing.

RJH Consultants, Inc. is currently designing Phase II to raise the dam. Construction of this phase will begin after U.S. Army Corps of Engineers approves the enlargement permit. Construction is expected to be completed by 2011.

1. Excerpts from this article are based on information posted on Parker Water and Sanitation District website [www.pwsd.org](http://www.pwsd.org) and feature story by Stephanie Sommers, McGraw Hill Construction, November, 2006.
2. Robert J. Huzjak, P.E. is the Chief Engineer for this project and is currently President of RJH Consultants, Inc.
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**Strair-step construction with unformed step edges .  
(by Gears, Inc.)**

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