

Hemlock Reservoir Dam Improvements



Fig. 1: Hemlock Dam downstream repair area

By George Machikas

The Aquarian Water Company of CT authorized the repair and resurfacing of the Hemlock Dam. The dam, commissioned in 1928, is about 2 mi (3.2 km) from Fairfield, CT. Size is approximately 1100 ft (340 m) long and 75 ft (23 m) high (Fig. 1). Shotcrete work was comprised of deep spall repairs and a continuous shotcrete coating to the upstream and downstream faces of the dam. Additional spall repairs and coatings were performed on the spillway, upper gate house, and training walls (Fig. 2).

The concrete repair material specified for the shotcrete placement was a prepackaged one component, cementitious, ready-to-use, silica fume enhanced, fiber reinforced, high strength, shrinkage compensated repair



Fig. 2: Hemlock Dam upstream and gate house repair area

mortar (SikaRepair®-224). In total, over 26,000 bags were mixed on site and shot using a wet-mix shotcrete pump with an attached mixer (Fig. 3). The finished shotcrete work included over 30,000 ft² (2800 m²) of repaired and coated dam surfaces.

Workers accessed the downstream face and training walls using aerial man lifts (Fig. 4 and 5). A barge was used to access the upstream faces and spillway. The barge working

deck elevations were controlled as needed by adjusting the reservoir water level.

The reservoir is a drinking water supply and has a pristine and thriving ecosystem, which is home to many species of wildlife, including largemouth bass, chain pickerel, and rainbow trout. To protect the reservoir's water, workers placed turbidity curtains on the upstream face on both sides of the gatehouse.



Fig. 3: Wet-mix pump with mixer using prepackaged repair mortar



Fig. 4: Shotcrete application from 80 ft (24 m) man lift



Fig. 5: Downstream shotcrete application

2024 OUTSTANDING REHABILITATION & REPAIR PROJECT

Project

Hemlock Reservoir Dam Improvements

Project Location

Fairfield, CT

Shotcrete Contractor

Patriot Shotcrete, LLC*

Architect/Engineer

Tighe & Bond, Inc.

Equipment Manufacturer

Putzmeister America*

Materials Supplier

Sika Corporation*

General Contractor

Blakeslee Arpaia Chapman Inc.

Owner

Aquarion Water Company of Connecticut

*ASA Sustaining Corporate or Corporate Member

Shotcrete was the obvious choice for the repairs because of the access challenges and time requirements of the project. Shotcrete placement eliminated the need for scaffolding, hand placement of repair materials, and complicated form work. Using shotcrete eliminated extensive hand work and avoided the complications of difficult access, yielding tremendous savings in time and cost as a result.



George Machikas is the Director of Operations for Patriot Shotcrete LLC located in Somerset, NJ with over 40 years of experience in the concrete and shotcrete industries following graduating from Lehigh University. More recent endeavors over the last ten years have been focused on structural shotcrete work in the Northeast, providing shotcrete work for tunnels, bridges, dams, building foundations, building retrofits, and support of excavation.