

WATER STRUCTURES CATEGORY

# Historic Dam Structural Repairs

NORTH CAROLINA

SUBMITTED BY PREMIER CORROSION PROTECTION SERVICES, INC.

The project was to repair a 325 ft (99 m) long concrete walkway at a 95-year-old dam that had serious concrete spalling and numerous cracks throughout its entire surface. Upon mobilization and further inspection, it was found that many of the structural components were in need of immediate repair. These components consisted of both transverse and lateral beams, structural buttresses, as well as the underside of the walkway itself. The underside of the walkway had multiple

ICRI Guidelines for concrete repair. Additional reinforcing for the beams was provided using carbon fiber, which was installed in stirrup fashion at all the beam-ends. The cracks in the buttresses were filled with epoxy. Carbon fiber “anchors” were dowelled and embedded with epoxy into the adjacent wall and splayed over the side of the buttress, giving the carbon fiber-reinforced polymer (CFRP) a “mechanical anchor.” CFRP was then installed over the anchors and wrapped over the four sides of the buttress. Upon completion, two coats of Class 5 coating were applied. New forms were installed along the sides of the walkway as well as the sides of the beams and archway. The archway was placed from the top with dowels extending into the slab.



The repair and strengthening of this 95-year-old dam will ensure many more years of use. This project was completed with no accidents or recordable incidents, and on time and under budget.

areas of overhead concrete spalling, failure of arch support, as well as failure at three concrete beams. One of the four main buttresses had significant cracking transversing the entire buttress.

The physical aspects of this project were challenging due to confined spaces, the severity of the structural damage, and strict environmental regulations. The contractor completed surface preparation for the slab repair in accordance with



## Historic Dam Structural Repairs

SUBMITTED BY  
**Premier Corrosion Protection Services, Inc.**

Tampa, FL

OWNER

**Duke Energy**  
Hayesville, NC

PROJECT ENGINEER/DESIGNER

**B2 Engineering**  
Cherry Hill, NJ

REPAIR CONTRACTOR

**Premier Corrosion Protection Services, Inc.**  
Tampa, FL

MATERIALS SUPPLIER/MANUFACTURER

**MAPEI Corporation**  
Deerfield Beach, FL