

ICRI 2010 Project Award Winner Award of Merit: Special Projects Category

Trickling Filter Feed Sump Repair at Palo Verde Nuclear Generating Station



Owner
Palo Verde Nuclear
Generating Station
Phoenix, Arizona

**Project Engineer/
Designer**
Gervasio & Associates, Inc.
Phoenix, Arizona

Repair Contractor
Structural Group,
Los Angeles Branch
Huntington Beach, California

**Material Suppliers/
Manufacturers**
BASF Corporation/
Construction Chemicals
Shakopee, Minnesota

The Euclid Chemical
Company
Cleveland, Ohio

The Palo Verde Nuclear Generating Station is the largest nuclear power plant in the U.S. and uses Phoenix, AZ, sewage effluent to cool the reactors and generate electricity. The Water Reclamation Facility provides tertiary treatment processing of approximately 90 million gal. (340.7 million L) of effluent per day. A pumping facility—the trickling filter/filter clarifier (TF/FC) sump—underwent significant concrete repairs in October 2008.

The repair design included the evaluation of multiple concrete-patching materials and the use of various protection mechanisms to provide a longer lifecycle. The repairs also involved significant testing evaluation of the repair materials prior to construction and verification testing during the repair process.

The construction schedule was incredibly short due to the short time frame in which the facility could be shut down. The entire project—from the initial access into the sump to the completion of all the repairs, the removal of all the formwork, scaffolding, and shoring, and the completion of all the cleanup—took only 9 days. The repairs included the following: erecting shoring to support loads, erecting scaffolding, chipping off deteriorated concrete beyond corroded reinforcing, sandblasting reinforcing steel to remove corrosion, repairing/supplementing damaged reinforcing steel (approximately 4500 lb [2041 kg] of new reinforcing steel was installed), water-blasting to remove dust and open pores of concrete, installing mechanical anchors at the bond line, installing anodes to protect reinforcing steel, applying reinforcing bar coatings to protect reinforcing steel, installing formwork, pouring repair-patching material (approximately 450 cubic feet [12.7 cubic meters] of repair material was poured), applying penetrating water repellent, applying curing and sealing coating, constantly evaluating/ testing repair materials, and removing shoring and scaffolding.