



Infrastructure Innovators Since 1994

QuakeWrap, Inc.

6840 S. Tucson Blvd., Tucson, AZ 85756

(520) 791-7000, FAX (520) 791-0600

Toll Free (866) QuakeWrap (782-5397)

www.quakewrap.com

PROJECT PROFILE

96-inch diameter PCCP circulation water piping rehabilitation with QuakeWrap®

FRP system at Apache Station

Repair System: QuakeWrap FRP technology applied to rehab large underground PCCP water piping

Owner: ARIZONA G&T COOPERATIVES, INC. APACHE GENERATING STATION

Contact: Nathen Hatch, Ph: 520-586-5509, email: nhatch@azgt.coop

FRP Installer: FRP Construction

Design and Materials: QuakeWrap, Inc.

Location: Cochise, Arizona

Project Synopsis:

- The large diameter prestressed concrete cylinder pipes (PCCP) at Arizona G&T's Apache Generating Station were inspected with the electromagnetic technology and three segments were identified as in immediate need of structural repair.
- QuakeWrap (design and materials) and FRP Construction (installation) team was selected for a design-build solution.
- QuakeWrap designed a fully-structural carbon fiber reinforced polymer (CFRP) liner system to retrofit (3) 20-foot sections of 96-inch PCCP.
- The design followed the AWWA C305 guidelines with a CFRP system that can take external (soil) pressure and 82 psi of internal (hydrostatic) pressure.
- Overall system is comprised of a tack coat (high-adhesion epoxy), seven layers of carbon fiber laminae (QW U27C and B41C), and a 20-mil top coat (epoxy).
- End terminations included QuakeWrap's dual fiberglass fabric (B2610G) and EPDM compression seal placed on top of the glass and carbon fiber layers per the AWWA C305 end termination detail.
- Installation was performed successfully by FRP Construction in less than two weeks using the wet layup method, accommodating the owner's desire to minimize downtime.

**Contact an engineer today at
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Project Photos



CFRP layers being applied with extra tack coat along the seams.



Compression seal (Weko) at the end termination.



Complete CFRP liner prior to applying top coat.

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