

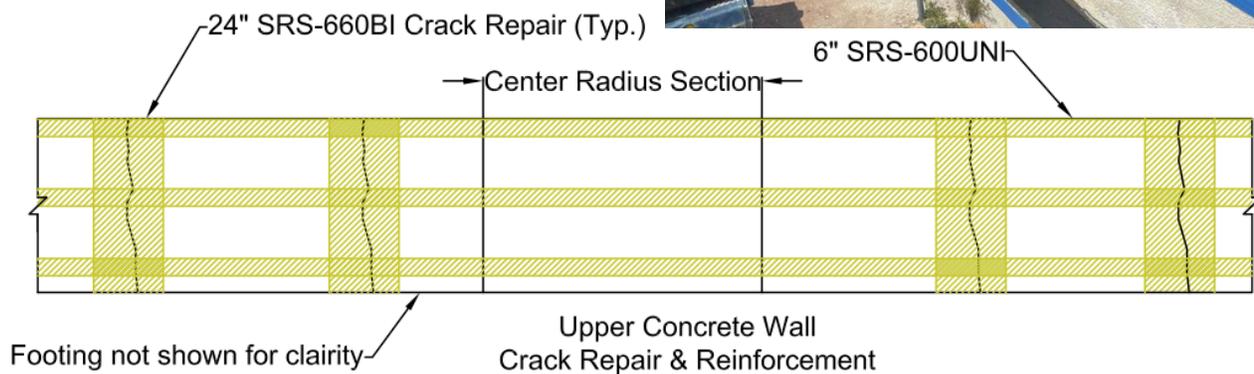
RETAINING WALL REPAIR & STRENGTHENING WITH CARBON FIBER

CALIFORNIA, USA



When concrete retaining walls fail, it can mean not only extensive landscape damage, but pose a significant safety risk to the public or surrounding property if left unaddressed. Retaining wall damage can be caused by saturated soils that result from improper drainage, footing damage due to settlement, rotation issues, or reinforcement deterioration over time.

This two tier California retaining wall was no exception, as multiple vertical cracks developed in both the concrete and brick levels of the structure. The property owner contacted a foundation repair contractor who had past experience with carbon fiber structural repair. The contractor reached out to Structural Reinforcement Solutions (SRS) for a complete strengthening design that permanently addressed the walls structural issues.



By utilizing both SRS's unidirectional and bidirectional fabrics which are bonded to the substrate with a structural epoxy adhesive, the walls were able to be repaired and reinforced against future damage. The carbon fiber reinforced polymer system (CFRP) provided permanent localized crack reinforcement as well as global strengthening of the walls. The dual component American made system has been designed by engineers and rigorously tested to perform as a long lasting repair solution for these applications.

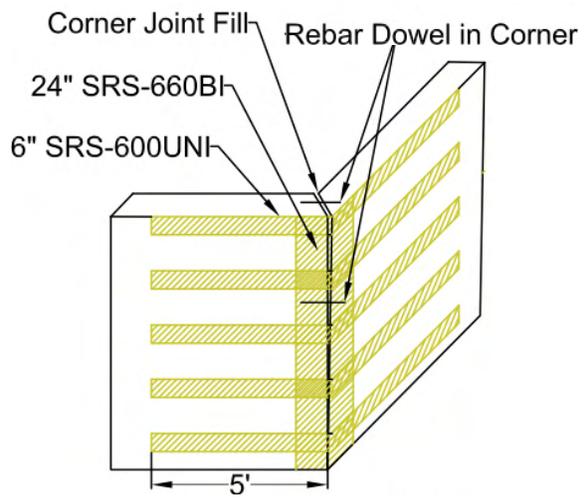
CARBON FIBER STRENGTHENING SYSTEMS



To protect the epoxy component of the system from UV rays and provide a uniform finish, the entire wall was prepared and parged with a cementitious coating.



The surface of the bricks were prepared and cleaned prior to bonding the 24" SRS-660 bidirectional carbon fiber as a localized crack repair.



The large void in the broken corner joint was filled with a non-compressible hydraulic cement prior to the installation of the CFRP. To ensure a flat and even profile was met beneath the carbon fiber, each mortar joint was filled flush to allow for the SRS-600 Unidirectional carbon fiber to be securely wrapped around each side to provide global strengthening of the corner.

The low viscosity SRS-1000 Structural Epoxy Adhesive is designed to penetrate into the pores of the brick substrate to permanently bond and transfer the strength of the commercial grade carbon fiber fabric to the substrate.



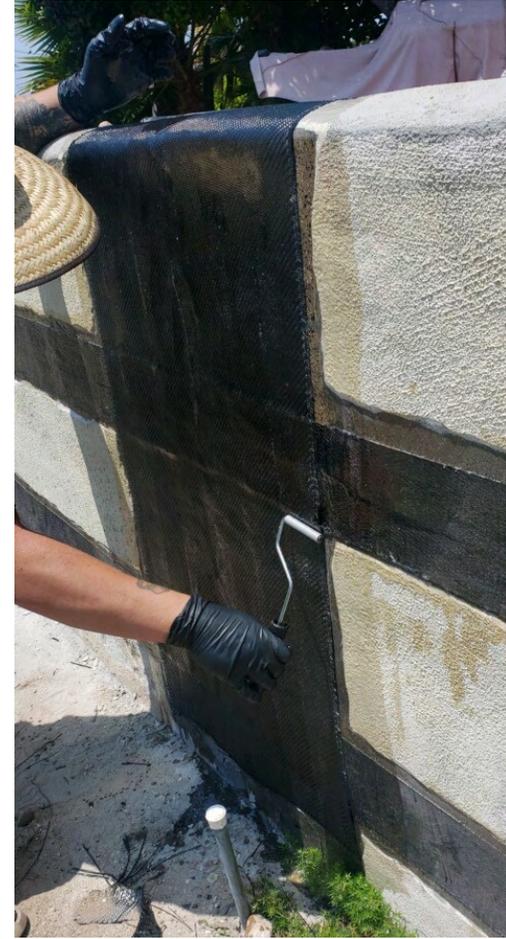
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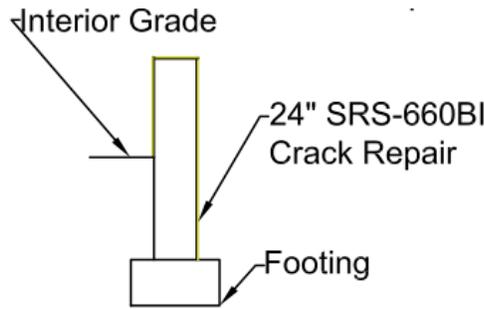
CARBON FIBER STRENGTHENING SYSTEMS



Due to the extremely high tensile strengths and very little elongation, the SRS-600 unidirectional carbon fiber is ideal to strengthen concrete structures such as columns, beams or walls. Providing design strengths over 196,000 PSI, this material delivers much greater reinforcement capabilities than steel, is non-corrosive, and at a fraction of the weight by comparison.



Injection ports were secured to both sides of the vertical cracks prior to them being injected with SRS-1000 Structural Epoxy Resin. The high strength non-compressible resin was used to fill the voids and bond both sides of the wall together at the crack locations.



With a confinement strength of over 35,000lbs per sq/ft, the 24" SRS-660 Bidirectional carbon fiber extended up the outside face, across the top and down the inside face of the wall cracks.

This retaining wall repair is just one of the many innovative concrete and masonry structural strengthening solutions available from Structural Reinforcement Solutions.

Learn more at Structuralrs.com

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