

CALIFORNIA'S LARGEST CARBON FIBER RETAINING WALL REPAIR PROJECT.

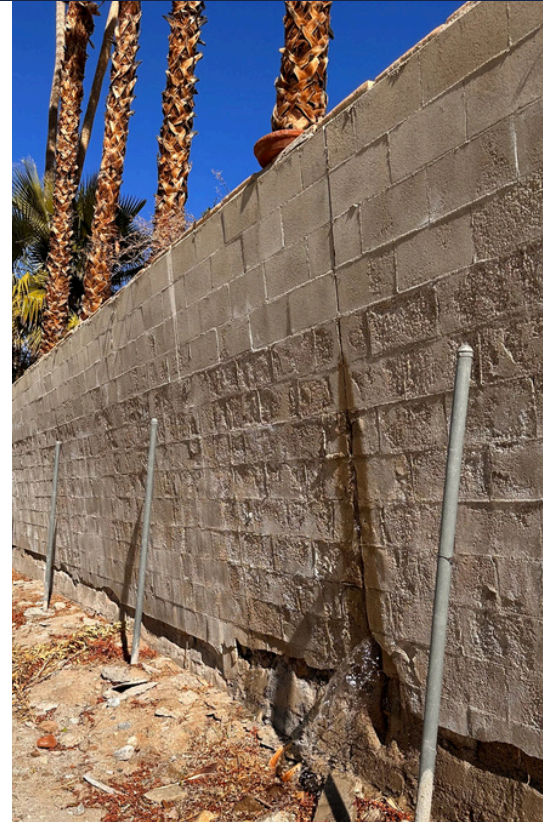
PALM SPRINGS, CA

Project Background:

A 650 foot-long retaining wall supporting six luxury homes in Palm Springs, CA showed severe structural distress including tilting, cracking, and soil pressure-induced instability. Originally built in 1973, the wall had been affected by:

- Tree root pressure from large palm trees
- Added weight from pools, hot tubs, and irrigation systems
- Shifting soils and seismic activity in the region

With limited space for invasive repairs, a collaborative effort between Helfrich Associates Engineering Consultants, Dalinghaus Construction, and Structural Reinforcement Solutions (SRS) led to a hybrid repair plan combining steel reinforcement and carbon fiber reinforced polymer (CFRP).



Challenges:

- Structural Instability – The wall had significant cracking, tilting, and localized failures.
- Seismic Considerations – The high-risk seismic zone required additional considerations.
- Limited clearance for Tiebacks in certain areas – Pools prohibited tieback installation for large sections of the wall.



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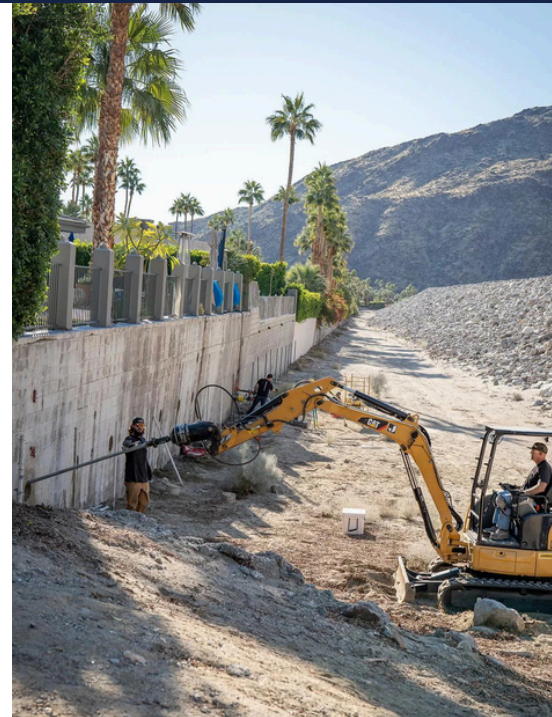


CARBON FIBER STRENGTHENING SYSTEMS

Reinforcement Strategy: Combining Steel and Carbon Fiber

To address these challenges, a strategic reinforcement plan was developed:

- Tiebacks were installed where possible, providing lateral support against soil pressures.
- CFRP reinforcement was applied vertically to provide flexural strengthening from top to bottom.
- CFRP was also applied horizontally as a waler system and was utilized to carry the load across the areas where tiebacks could not be installed.
- Surface preparation included crack repairs and adhesion optimization before carbon fiber application.
- A UV protection coating was applied to safeguard the carbon fiber from sun degradation.



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Implementation:

Structural Reinforcement & Load Distribution

- Dalinghaus Construction installed tiebacks at select points to anchor the wall into stable soil layers.
- CFRP was applied in strategic locations to carry the restraint forces across unsupported sections, mimicking a waler system.

Surface Preparation & Carbon Fiber Application

- The wall was cleaned, cracks were repaired, and bonding surfaces were prepped for optimal adhesion.
- SRS-600UNI unidirectional CFRP was applied vertically for flexural strengthening and horizontally to help distribute the loading on the wall across the tiebacks.

UV Protection & Finishing

- A protective coating was applied to shield CFRP from UV exposure, ensuring long-term durability in the harsh California climate.



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Results:

- Structural Integrity Restored – The wall was stabilized against soil pressure and seismic forces.
- Cost-Effective, Non-Invasive Repair – Avoided major excavation or full reconstruction.
- Increased Strength & Load Distribution – 6" wide SRS-600UNI provides over 2x the tensile strength of a #5 rebar.
- Preserved Aesthetics – The thin CFRP application when coated blends in to maintained the wall's appearance.



Conclusion:

By integrating carbon fiber reinforcement (CFRP) with steel tiebacks, this project showcased the power of modern structural strengthening solutions. The non-invasive, high-strength repair ensured long-term stability while minimizing disruption to homeowners and landscaping.

Read more about SRS retaining wall repair solutions:

[Retaining Wall Strengthening & Stabilization](#)

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