

# CARBON FIBER SEA WALL STRENGTHENING

CAMANO ISLAND, WASHINGTON STATE



## An unconventional and collaborative approach to strengthening Sea Walls in the Pacific North West.

After years of wear and tear from rising and falling tides, debris, and rough seas, the owners of this oceanfront property in the San Juan Islands reached out to R&R Foundation Specialist for options to strengthen and preserve their seawall. The initial inspection revealed multiple cracks, joints, and areas of deterioration that needed to be addressed..

R&R reached out to SRS for support in putting together a reinforcement plan for the wall. A few of the neighboring properties had seawalls where cracks were addressed with CFRP but these were merely crack repair jobs. In this case, the owners wanted to strengthen the wall and preserve it for many years to come. Since the tides in this area of Camano Island vary greatly depending on the time of year, the installation was scheduled during a window that allowed the entire wall to be media blasted prior to the CFRP installation the following day.

Using an environmentally safe crushed glass medium, the entire surface of the wall was thoroughly prepared. This process removed years of algae and marine contaminants from the concrete substrate while opening up the pores of the concrete to allow for epoxy penetration

In this case, all of the cracks and deteriorated joints were addressed with the SRS-660BI in order to reestablish strength across the cracks as well as keep unwanted moisture from infiltrating the wall through these joints. The SRS-600UNI was used to provide global strengthening of the wall in order to make up for any section loss in the existing reinforcing steel and to provide additional reinforcement against the pressures from the soil behind the wall. The corners were also strengthened by wrapping them with the SRS-600UNI.

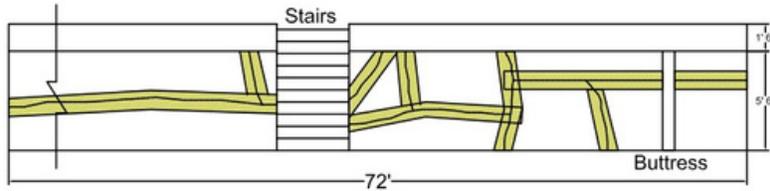


# CARBON FIBER STRENGTHENING SYSTEMS

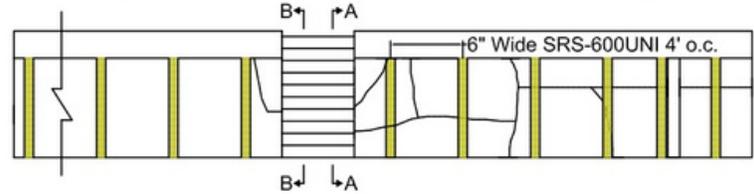
The marine environment is an extremely corrosive one thanks to the highly corrosive effects of salt water. Composite materials are a great fit for maritime applications because of their natural corrosion resistance vs alternative strengthening materials such as steel. Another factor to consider with any exterior carbon fiber installation is long term exposure to UV light. While the carbon fiber component of reinforced polymer is unaffected by UV, the epoxy requires protection from the sun's powerful ultra violet rays in order to maintain its structural properties.

Anyone familiar with the winter sea conditions in the Pacific North West understand these turbulent waters contain heavy debris from logging operations that can batter any exposed concrete structures during violent storms. Since protective coatings vary greatly and are specific to the environment in which the CFRP is to be installed, SRS worked with the experts at Chemco Systems in California to specify an appropriate marine coating.

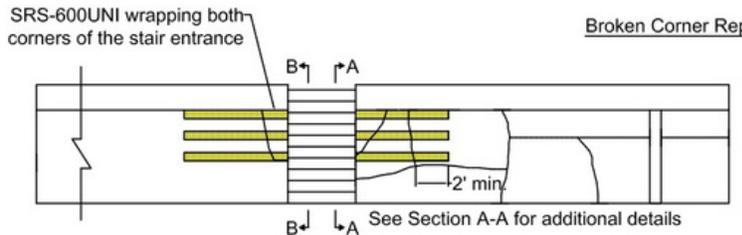
Crack Repairs - 12" Wide SRS-660BI



Supplemental Wall Reinforcement - 6" Wide SRS-600UNI



Broken Corner Repairs:



To address the environmental factors, a hybrid Epoxy/Kevlar marine coating was applied to the entire sea wall, providing a uniform finish while protecting the CFRP installation. This is just one example of the innovative repair solutions SRS has developed for the preservation of sea walls and concrete infrastructure.



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