

Proactive crack and joint repair solution saves seawall from costly rebuild



BACKGROUND Homeowners association members notice cracks in concrete seawall protecting their development

The Fidalgo Shores II condominium community in Anacortes, WA, faces Burrows Bay, which allows direct access to the Pacific Ocean. Since the mid-1980s, the development has been protected by a concrete seawall that absorbs the brunt of storms and pounding waves, deflecting nature's tidal fury away from the two-story, multifamily residences.

Members of the Fidalgo Shores homeowners association (HOA) regularly walk the beach at low tide. By the late 2010s, some of them had begun noticing damage along the seawall. Cracks of various sizes had formed and, together with widening vertical joints, were exposing the internal steel reinforcements to water intrusion.

THE CHALLENGE Repair seawall cracks to forestall rebuilding or replacing the entire structure

The first thing the HOA did was to consult a local contractor for a bid on removing and replacing the entire seawall. The proposed cost was in the hundreds of thousands of dollars. To find another solution, the homeowners contacted Kingworks Consulting Engineers, PLLC, in Bellingham, WA, who in turn consulted Simpson Strong-Tie as an expert resource on concrete repair, protection and strengthening (RPS).

In November 2019, Simpson Strong-Tie RPS Specialist Eric Olsen visited the site to assess the damage and discuss the relative advantages of various remedies. Olsen walked the length of the seawall with several of the homeowners.



The cap of the seawall directs waves away from the buildings.



Openings like this allowed for erosion in and behind the wall.

PROJECT INFORMATION

Project

Burrows Bay Seawall in Anacortes, WA

Project Category

Bridge and Marine

Project Owner

Fidalgo Shores II HOA

Project Engineer

Kingworks Consulting Engineers, PLLC

Application

Repair cracks in concrete wall to prevent more extensive repairs or structural replacement

Simpson Strong-Tie Products

CI-LV low-viscosity structural injection epoxy; CIP-LO low-odor paste-over epoxy and crack sealant; FX-764 splash zone and underwater paste; FX-225 non-shrink underwater grout

CHALLENGE

Repair seawall cracks to avoid full seawall replacement.

SOLUTION

Strengthen concrete and protect rebar by injecting structural repair epoxy into cracks and by sealing and backfilling vulnerable joint fissures.

RESULTS

Proactive crack repairs and joint strengthening give seawall a new lease on life, at a fraction of the replacement cost.

During his observation, he noticed an orange/red discoloration around some of the longitudinal crack and vertical joints. This would indicate corrosion and likely expansion of the reinforcing steel, which can lead to further cracking and additional corrosion. At the same time, however, the wall appeared to be vertically straight and structurally sound. Thanks to the association's proactive vigilance, Olsen told his hosts, structural repairs were still possible that could forestall a full replacement of the seawall.

THE SOLUTION Use structural epoxy injection products to repair concrete cracks and protect reinforcing steel against further corrosion; seal and backfill widening joints



Major cracks were pressure-injected with structural epoxy.

The remedy that Olsen recommended consisted of repairing and strengthening the cracked concrete so as to protect the underlying rebar from further corrosion. Specifically, he advised having a licensed and bonded contractor pressure-inject the cracks with a structural repair epoxy material, while sealing the vertical joints with a splash-zone material and then backfilling the joints with underwater grout to prevent water from penetrating the spaces and eroding the soil behind the structure. For this work, he recommended Western Specialty Contractors, a local firm with expertise in concrete restoration and epoxy injection.

In August 2020, with onsite guidance and support from Olsen, the contractor pressure-injected approximately 250 linear feet of cracks with Simpson Strong-Tie CI-LV low-viscosity structural injection epoxy, pasted over with Simpson Strong-Tie CIP-LO low-odor epoxy and crack sealant. The vertical joints were filled with Simpson Strong-Tie FX-225 non-shrink underwater grout after being sealed with FX-764 splash zone and underwater paste.

THE RESULTS A month's work adds years of life at a bargain to the residential development's protective seawall

The repairs, timed to coincide with low tides, were completed in less than a month. Reasonable estimates are that, by being observant and proactive rather than waiting until a total rebuild of the wall was unavoidable, the HOA saved themselves several hundred thousand dollars in expenses.

Fred Kaufhold of the Fidalgo Shores II HOA was generous with his gratitude for the in-person service provided by Simpson Strong-Tie throughout the project:

As an owner in a condo development that has benefited directly from the Simpson Strong-Tie line of products, I can say without hesitation that our condo seawall is greatly improved and ready to face many more years of winter storm assaults than was thought possible before we met Eric Olsen from Simpson Strong-Tie. Eric came out to our location, walked the seawall with us and explained in great detail how our many problems

had developed and how his products could be used to correct these problems... After the job commenced with a contractor recommended by him, Eric returned to the job, discussed the progress with the supervisor...and generally gave us and the contractor a sense of doing the job right. Upon completion of the job, Eric returned again...

I have been very impressed with the level of customer service provided by Simpson Strong-Tie...and would highly recommend their products and services to anyone... Actually, I already have made that recommendation to... neighbors with similar seawall issues.

This case serves as a further reminder that, in concrete construction jobs and other complex projects, service and support can often make a huge difference in customer satisfaction.

**MORE
INFO**

For complete information regarding specific products suitable to your unique situation or condition, please visit strongtie.com/rps or call your local Simpson Strong-Tie RPS Specialist at **(800) 999-5099**.