

CASE STUDY

COASTAL CONCRETE COLUMN REINFORCEMENT: A STEP-BY-STEP GUIDE

OCEANSIDE DRIVE, SCITUATE, MA

Project Background:

The coastal environment along Oceanside Drive in Scituate, MA, posed unique challenges for the structural stability of nine concrete columns, which had suffered severe deterioration from the relentless Atlantic saltwater exposure and harsh coastal weather.

This coastal concrete column reinforcement project serves as a step-by-step case study, showcasing how Ram Jack North East, awarded the project, collaborated with Structural Reinforcement Solutions to restore the columns' strength and durability.

**Initial Surface Preparation and Treatment**

The project began with thorough surface preparation. Paint, contaminants, and loose material were carefully removed to open the concrete's pores, creating an optimal surface profile. This essential step ensured proper adhesion for the upcoming repair treatments and reinforcement products.

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Corrosion Protection with SRS-4100 Steel Guard

Next, SRS-4100 Steel Guard was applied to protect the embedded steel within the columns. This advanced vapor-phase corrosion inhibitor formed a durable passivating film on the steel, reducing chloride migration and mitigating both anodic and cathodic corrosion.

This application enhanced the columns' durability, ensuring the embedded steel would resist future corrosion, even in a saltwater-laden environment.

Application of SRS-4000 Concrete Guard

SRS-4000 Concrete Guard was applied to the cleaned concrete surfaces as a pre-treatment to enhance durability and reduce porosity. By bonding with the cement matrix, it increased the concrete's strength, making it more resilient and better prepared for the carbon fiber reinforcement.

This treatment minimized the need for demolition and provided a strong foundation that helped the concrete withstand environmental challenges.

Structural Crack Repair with SRS-3000 Epoxy and SRS-2100 Rapid Cure Concrete Repair Paste

For existing cracks in the concrete, SRS-3000 Low Viscosity Epoxy Injection Resin was applied to restore structural integrity. This high-strength epoxy penetrated deeply into the cracks, sealing them securely and providing a reliable repair.



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Reinforcement with SRS-1000 Structural Epoxy Adhesive and SRS-600UNI Carbon Fiber Fabric

Finally, the columns were reinforced with the combined system of SRS-1000 Structural Epoxy Adhesive and SRS-600UNI Carbon Fiber Fabric. The SRS-1000 epoxy provided a strong bond, ensuring the carbon fiber adhered securely to the concrete.

SRS-600UNI, with its high strength-to-weight ratio, conformed seamlessly to the columns' shape, increasing load capacity, shear strength, and overall stability. This cohesive system minimized movement and provided a long-lasting, non-corrosive reinforcement solution tailored to withstand the coastal elements.

Results and Conclusion

Through the combined expertise of SRS and Ram Jack North East, each concrete column was restored to meet the demands of its coastal environment. The tailored use of SRS products not only repaired the concrete columns but also fortified them against future deterioration, delivering a durable and resilient solution.

This project demonstrates how targeted reinforcement systems can transform vulnerable structures, providing lasting protection against challenging environmental conditions.



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