CASE STUDY

STRUCTURAL REINFORCEMENT SOLUTIONS

PROTECTING CRITICAL INFRASTRUCTURE: COLUMN REPAIR FOR TELECOM TOWERS

MARATHON, FL

Project Background:

An emergency telecommunications tower in the City of Marathon, Florida, required structural reinforcement of its concrete masonry support columns, which exhibited signs of deterioration including surface cracking and minor spalling. Given the tower's essential role in public communications and its exposure to a high-humidity coastal environment, a non-invasive, surface-applied strengthening system was specified. The repair utilized a fiber-reinforced polymer (FRP) solution consisting of bidirectional carbon fiber fabric and high-strength epoxy—providing structural confinement, enhanced load resistance, and long-term durability in corrosive marine conditions.

The Solution:

Structural Reinforcement Solutions' SRS-660BI Carbon Fiber System was specified to provide a high-performance, surface-applied strengthening method for deteriorating concrete columns. The bidirectional fiber-reinforced polymer (FRP) fabric was installed using SRS-1000, a high-strength epoxy engineered for secure bond performance and long-term durability. Together, these components formed a fully bonded composite wrap that provided structural confinement and enhanced resistance to environmental exposure—delivered without the need for demolition or disruption to service.

CARBON FIBER STRENGTHENING SYSTEMS

Key Components of the Repair Strategy

- SRS-660BI Bidirectional Carbon Fiber Fabric — Applied to wrap and structurally confine the concrete columns, enhancing strength and durability
- SRS-1000 Structural Epoxy Adhesive — Used to saturate and bond the carbon fiber directly to the prepared concrete surface

** In cases where concrete exhibits more advanced deterioration—such as significant voids, surface degradation, or indications of embedded steel corrosion—supplemental products including SRS-2100 Structural Repair Paste, SRS-4000 Concrete Guard, and SRS-4100 Steel Guard may be incorporated to improve substrate integrity, enhance bond conditions, and mitigate long-term durability risks.

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Result:

This project highlights the foresight of Marathon County, whose decision to specify a surface-applied carbon fiber reinforcement system demonstrates a strong commitment to long-term infrastructure resilience. By choosing a non-invasive and proven composite strengthening method, the County reinforced a critical communications structure with minimal disruption—extending its service life and ensuring continued performance in a challenging coastal environment.

Repair Process Overview

The repair began with surface preparation to remove loose or deteriorated concrete and ensure a clean, sound substrate. Once prepped, SRS-660BI Bidirectional Carbon Fiber Fabric was applied using SRS-1000 Structural Epoxy Adhesive, which was used to saturate the fabric and bond it securely to the column surface. This process created a high-strength composite wrap that provided structural confinement and long-term reinforcement.

** In typical SRS repair plans, a sand broadcast into the final epoxy layer is recommended to create a textured surface that helps bond an aesthetic or protective topcoat. This step can help enhance UV resistance and environmental durability, especially in exposed exterior applications.