

# CARBON FIBER REINFORCEMENT FOR POST-TENSIONED SLAB REPAIR

VERO BEACH, FL

## Project Background:

A large commercial structure required reinforcement for its post-tensioned (PT) concrete slab after construction errors resulted in excessive flexural stress at slab supports. Misaligned tendons caused a punching shear issue, compromising the slab's structural integrity. Initial repair considerations included drop panels to improve load distribution, but further strengthening was necessary to ensure long-term stability and safety.



## Challenges:

- Increased Flexural Stress – Misaligned PT tendons led to structural deficiencies at slab supports.
- Shear Weakness – The slab was vulnerable to punching shear failure due to insufficient reinforcement.
- Minimizing Disruption – A repair method was needed that avoided extensive demolition or prolonged downtime.

## Solution:

To address these deficiencies, Structural Reinforcement Solutions (SRS) developed a comprehensive carbon fiber reinforcement plan, utilizing SRS-600 UNI-Directional CFRP for primary strengthening and SRS-660 BI-Directional CFRP in select locations requiring shear reinforcement. This externally bonded CFRP system provided a cost-effective, non-invasive solution that restored slab strength while minimizing downtime.

Learn more at [Structuralrs.com](https://www.Structuralrs.com)

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# CARBON FIBER STRENGTHENING SYSTEMS

## The Repair Process

- **Surface Preparation:** The concrete surface was prepared to ensure optimal adhesion for the CFRP application.
- **Primary CFRP Strengthening:** The SRS-600 Unidirectional Carbon Fiber System was applied in high-stress areas to improve flexural capacity.



- **Shear Reinforcement:** In select locations requiring additional shear strengthening, SRS-660 BI-Directional Carbon Fiber Wraps were applied to enhance load transfer and confinement strength.
- **Load Transfer Considerations:** CFRP strips extended 18 inches beyond rebar locations to ensure proper anchoring and reinforcement effectiveness.

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## Results

- The CFRP reinforcement system successfully restored the slab's structural integrity while avoiding costly and time-consuming demolition.
- Increased load-bearing capacity, addressing both flexural deficiencies and shear concerns.
- Significant cost savings compared to traditional concrete repair methods.
- Minimal facility downtime due to rapid installation.
- Long-term durability with CFRP providing a permanent strengthening solution.



## Conclusion

This project highlights how carbon fiber reinforcement is an effective, high-performance solution for post-tensioned slab repair. Using SRS-600UNI and SRS-660BI CFRP, the structure was strengthened efficiently without extensive modifications, ensuring durability, cost savings, and minimal disruption.

For more information on this project and other case studies, visit our CFRP [Case Study Gallery](#).