CASE STUDY

BRIDGE PIER COLUMN PROTECTION USING CFRP WRAPS | DOT-DIRECTED REINFORCEMENT

OHIO

Project Background:

During the construction of a bridge featuring 6-foot diameter mass concrete pier columns, hairline surface cracking was observed following several large pours. The General Contractor collaborated with the state Department of Transportation (DOT) to investigate the cause and identify an appropriate course of action.

Subsequent rebar scans revealed that in some locations, reinforcement clearances did not meet plan-specified minimum cover requirements. In addition, thermal monitoring indicated that portions of the concrete had exceeded the thresholds established in the thermal control plan—both factors that could accelerate surface deterioration over time.

CARBON FIBER STRENGTHENING SYSTEMS

The Solution:

To address the DOT's concerns and enhance the long-term durability of the pier columns, Carbon Fiber Reinforced Polymer (CFRP) was selected as the preferred mitigation method. SRS worked closely with the General Contractor to develop and submit an engineered CFRP solution for approval.

The approved plan called for wrapping all pier columns with a unidirectional carbon fiber fabric, saturated and bonded with a High-Strength Epoxy Adhesive. This surface-applied system provides external confinement, improves crack resistance, and adds a protective layer to help guard against future deterioration caused by environmental exposure or reduced cover.

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Installation Support

Structural Reinforcement Solutions supplied the CFRP materials, provided installer training, and remained engaged throughout the installation to ensure the system was applied according to design specifications and industry best practices.

Result:

The CFRP installation provided a cost-effective, minimally disruptive solution to extend the durability of the newly constructed bridge components. By proactively wrapping the pier columns, the project team addressed DOT performance concerns while avoiding costly structural modifications or delays.