RHINO
CARBON FIBER
REINFORCEMENT PRODUCTS

CFRP CASE STUDY

STRENGTHENING CONCRETE SILOS WITH CFRP

LOCATION
Cupertino, California

PRODUCTS USED

- Rhino Carbon Fiber™ CFRP (Bidirectional): 560 GSM in 24-Inch Widths
- RCF™ Saturant-Adhesive Epoxy

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CASE BACKGROUND

A consulting engineer in Northern California was looking for a solution to strengthen three 70-year-old cracking concrete silos in Cupertino, California. The silos are storage facilities for a nearby mine, and some of the materials mined contain corrosive elements. The concrete around the silos deteriorated and formed cracks as a result of these corrosive elements. The now-destabilized silos were leaking and could only be operated at 50-60% of their capacity.

The consulting engineer considered many options for the repair, such as shotcrete, spray-on mortar and concrete patching, but ultimately concluded that using CFRP would be the most reliable solution due to its high-strength, resistance to corrosion, cost-effectiveness, light-weight and ease-of-application. The engineer contacted **Rhino Carbon Fiber™** and determined that 560 GSM **Rhino Carbon Fiber™ CFRP (Bidirectional)** in 24-inch widths would be the best option for the repair due to the 560 GSM's strength in all directions.

THE SOLUTION

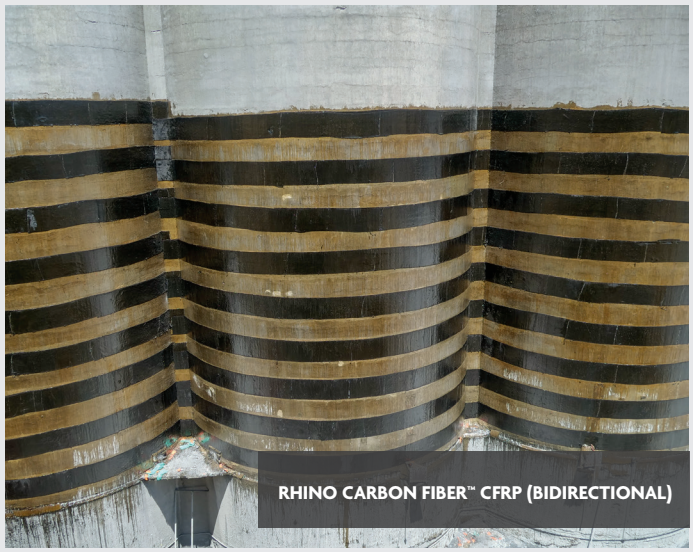
Surface preparation of the concrete is critical to ensure a strong epoxy bond. Two crews of four marked the locations where the CFRP straps would be applied with spray paint. Then the entire surface area was hydro-blasted within the marked areas in order to obtain a clean surface with absence of the laitance layer and with adequate roughness level. They utilized a "hoop-strength reinforcement" method of application for the CFRP, which refers to wrapping around the silos like a belt.

As a final step, the CFRP was covered with a UV-resistant coating to protect the CFRP system from UV light deterioration. Upon completion, the silos were effectively restored and are operating at 100% capacity.

HYDRO-BLASTING

RHINO CARBON FIBER™ CFRP AND RCF™ SATURANT-ADHESIVE EPOXY

REPAIR INSPECTION



RHINO CARBON FIBER™ CFRP (BIDIRECTIONAL)

1-888-684-3889 **www.rhinocarbonfiber.com** **info@rhinocarbonfiber.com**

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