



STRONGHOLD™

# Concrete Repair & Strengthening Systems

**Building Stronger Bonds™**

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## **Introduction**

HJ3's line of StrongHold™ Repair Systems offer concrete repair and strengthening systems for large-scale industrial projects, from processing facilities to plants to public buildings to bridges and underwater infrastructure.

StrongHold™ systems offer structural strengthening of concrete, masonry, steel and wood structures and the comprehensive product line is designed to be used for concrete patching and repair, structural strengthening and seismic retrofits. The systems include injection, patching, and glass and carbon composite reinforcing wraps.

## **Key Applications**

- Buildings
- Bridges
- Parking garages
- Residential homes
- Underwater infrastructure
- High temperatures
- Chemical environments

## **Benefits**

- Drinking water and FDA approved
- Complies with ACI 440.2R
- Supported by City of Los Angeles LADBS Report
- Up to 95% strength retention after 20+ years of exposure to aggressive acids, caustics, dry and humid environments, and biologically active soil.

 **+20-year**

in-service history

 **+300 chemicals**

extensive durability testing

 **20,000 hours**

accelerated testing in acids, caustics, seawater, ultraviolet (UV) radiation and biologically active environments



## Durability and Strength, Delivered

StrongHold™ Repair Systems, used to repair and strengthen more than 5 million square feet of damaged structures, are the highest per-ply systems available in the industry. Supported by extensive durability testing, StrongHold™ can also be enhanced with ChemSeal™ coating and liner products to maximize the lifespan of repairs for abrasive conditions and harsh chemical environments.

## Solutions for Every Structure

- Columns
- Beams
- Walls
- Slabs
- Silos
- Tanks
- Hoppers
- Pedestals
- Risers
- Underground Pipes
- Seismic Retrofit

## We're Ready and We're Responsive

Within 24 hours, our team of licensed professional engineers specializing in industrial composite repair designs are able to send your team calculations, application procedures and pricing estimates for your project.



## Solutions for Every Environment

**StrongHold™**

**HTI**

High Temperature

**StrongHold™**

**Chem**

Severe Chemicals

**StrongHold™**

**NSF61**

Drinking Water & FDA

**StrongHold™**

**SUBSEA**

Underwater

## AT WORK

### Structural Rehabilitation

#### STRENGTHENING A SALT MINE LOAD OUT

Structural rehabilitation was needed for a salt mine load out where more than 60 years of salt mining had precipitated steel loss and structural degradation of walls, columns, beams and secondary members.

HJ3's engineered system addressed the lost tensile and offered shear reinforcement in the external wall, targeted columns and internal supports. Most notably, the repairs were conducted while the facility remained in operation — which meant no down time or outages.

#### OUTCOME

The use of CarbonSeal, with StrongHold, restored the strength of the facility and extended its life by up to 30 years.



## AT WORK

### Structural Repair

#### RESTORING FERTILIZER PEDESTALS

Chemical corrosion, due to ammonia nitrate, caused significant corrosion of a fertilizer's steel tank and concrete pedestal — creating notable cracks and structural concerns.

HJ3 surveyed the conditions of the pedestals and designed a customized repair solution to ring the structures back to their original strength. After performing a concrete restoration, HJ3's certified installers utilized the StrongHold™ CHEM Repair System for structural strengthening along with a patch confinement system to provide a long-term concrete repair solution.

#### OUTCOME

**The entire repair cost the plant no down time, as it was conducted during a regular, five-day outage, and the StrongHold™ Repair Systems installed extends the life of the structures by 20 years.**



## AT WORK

### Seismic Addition

#### SUPPORTING A NEEDED EXPANSION

The UCLA Anderson School of Management needed to add 63,000 square feet to its existing footprint and incorporate a seismic upgrade for five levels of its parking structure.

HJ3's Certified Installer reinforced the underside and top of the slab and wrapped 25,000 square feet of columns and beams over the course of multiple phases, to ensure the structures could remain in operation during installation.

#### OUTCOME

HJ3 utilized its **StrongHold™ Civil System** for the project to control costs and reduce installation interference, which would have been more extensive had additional concrete and steel been used for reinforcements.



**AT WORK**

**Concrete Restoration**

**REPAIRING A CORRODED PRODUCT TANK**

A 900-ton potash processing tank, set atop a 33-foot pedestal, experienced significant deterioration due to corrosion from chemical exposure. That tank is critical to the plant's operation, which means any repair would need to be conducted while it remained in operation.

HJ3's Certified Installer removed the compromised concrete and prepped the remaining structure before protecting the exposed reinforcement with an epoxy sealant to prevent future corrosion and deterioration.

**OUTCOME**

**This approach allowed the tank to remain in operation, eliminating downtime, and extended its life by 10 years.**



## AT WORK

### Roof Rehab

#### STRENGTHENING AND REPAIRING A HISTORIC THEATER

The historic Greek Theater needed to reinforce its concrete deck for additional loads and meet seismic strengthening requirements while replacing tiles on its roof. Significant cracking and spalling had been discovered while replacing the tiles.

HJ3 applied for and received an approval from the City of Los Angeles to utilize the StrongHold™ Civil Strengthening System to address the building's needs, which included crack injection and patching on the roof slab to ensure its integrity. The application of high strength composites added the needed seismic strengthening and allowed the team to work around numerous obstructions while working on a sloped roof.

#### OUTCOME

**HJ3, together with the Certified Installer, provided a turnkey repair by manufacturing the materials, performing value engineering, working to receive complex design approval and executing the installation.**







**Building Stronger  
Bonds™**

**STRONG HOLD™**

**Our team of engineers can design custom structural solutions for you.**

**Call today: 520-322-0010**

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