



# Project Overview

## FRP STRENGTHENING OF 16" THICK CONCRETE SLAB

**Name:** Minnesota Power, Thompson dam  
**Type:** Concrete Slab  
**Location:** Duluth, MN  
**Completed:** October 2012

### PROBLEM

A 16" thick concrete slab in this power plant lacked the internal steel reinforcement to withstand the weight of service trucks. The area in need of strengthening needed vehicle access for repairs and maintenance of the turbines at the Hydro-electric power plant. In its current condition the slab could only withstand flexural capacity from a maximum single wheel load of 1500lb.

### SOLUTION

A Carbon Fiber Reinforced Polymer system was proposed as a solution to increase the flexural capacity from a maximum single wheel load of 1500lb to 5500lb. QuakeWrap® VU18C carbon fabric was saturated with QuakeBond™ J300SR Saturating Resin. Once saturated 1 layer of the 2' strips were applied on the under-side of the slab in the area of the needed reinforcement.

The original steel reinforcement in the concrete slab was #4 rebar, 12" off center. Once FRP is fully cured the slab achieved the equivalent of #4 rebar 6" off center which is known to withstand a maximum single wheel load of 6500lbs.



## Technical Highlights

- FRP Strengthening is provided to increase the flexural capacity of the existing 16-in thick floor slab
- The Strength of the slab was increased from 1500lb maximum single wheel load to 5500lbs maximum single wheel load.
- Repair work done with no disruption to the plant operations.
- Repair was completed in only two days



## Credits

Structural Engineer: QuakeWrap, Inc.  
Material Supplier: QuakeWrap, Inc.  
Contractor: FRP Construction, LLC



*"The FRP Retrofit Experts"*