



# Project Overview

## CARBON FRP STRENGTHENING OF CONCRETE SLABS

**Name:** Apple Computer Store  
**Type:** Commercial (Shopping Mall) Floor  
**Location:** Galleria Mall, Glendale, CA  
**Completed:** October 2007

### PROBLEM

An existing retail space located on the second floor of a mall required remodeling to accommodate an Apple Computer store. A heavy high density filing system needed to be installed and it was determined that the existing floor system required flexural strengthening. The owner retained the services of a local structural engineering firm to provide a solution to the problem. The solution called for the use of FRP bands installed on the bottom of the existing precast floor planks. Access to the bottom face of the planks was difficult given that the surrounding area was a confined space full of electrical and HVAC installations, as well as the support wires of a fall ceiling for a retail store located in the first floor. Given the confined environment, the need to assemble and reassemble scaffolding systems and the restricted working hours required in order to minimize disruptions of the first floor store operations, the FRP installation schedule was set for 3 weeks.



### SOLUTION

QuakeWrap, Inc. was retained as the FRP installation contractor and provided an alternative design that allowed for the installation of the FRP fabric on top face of the floor planks. The effect of this design improvement was dramatic, cutting down the installation time from 3 weeks to 1 day.



## Technical Highlights

- FRP flexural retrofit of precast plank floor system.
- FRP carbon strips placed on top face of planks to avoid confined and congested area under planks.
- 1,320 ft<sup>2</sup> of QuakeWrap® carbon fabric strips used.
- QuakeWrap® design resulted in significant time saving

## Credits

Engineering and Installations: QuakeWrap, Inc., Tucson, AZ  
General Contractor: Shawmut Construction, Boston, Mass.



*“The FRP Retrofit Experts”*