

# FRP solution helps with quick resuscitation of Anchorage YMCA after earthquake damage



## PROJECT INFORMATION

**Project**

Anchorage YMCA

**Project Category**

Restoration and Retrofit

**Project Owner**

BBFM Engineers Inc.

**Application**

Repairing and reinforcing earthquake-damaged exterior CMU walls

**Simpson Strong-Tie Products**

CUGF27 code-listed unidirectional E-glass fabric; CSS-ES epoxy primer and saturant resin; DTT2 deck tension tie (for tying down the roof)

**BACKGROUND** Structural damage from 2018 earthquake causes Anchorage YMCA to be closed to the public

The Anchorage YMCA first opened in 1978. The original construction was CMU, both grout filled and hollow, for the exterior walls of the two-story section of the gymnasium.

On the morning of November 30, 2018, a magnitude 7.1 earthquake struck south-central Alaska about 10 miles north of Anchorage, followed six minutes later by a magnitude 5.7 aftershock. The shaking caused significant structural damage to the YMCA gymnasium, closing it for use by the community until repair and retrofit could be undertaken.

**THE CHALLENGE** Restore and reinforce structurally unsound CMU walls cracked during earthquake

The extent of the damage to the gymnasium walls meant that the walls first had to be moved back in plane and anchored there before the CMU could be repaired and reinforced. Cracks ran through both the interior and exterior faces of the walls, so the retrofit solution had to be applied to both surfaces of the wall. As an added challenge, because the FRP work was taking place in Alaska in November, contractors had to tent and heat the building's exterior walls before and during installation and for the entire cure time.



A heated tent was created on the exterior of the gym for FRP installation in Alaska in November.

**CHALLENGE**

Restore and strengthen cracked, out-of-plane CMU walls.

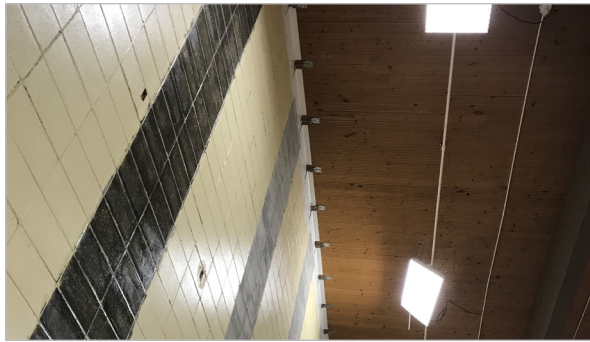
**SOLUTION**

Anchor walls back in plane before strengthening cracked CMU with code-listed FRP.

**RESULTS**

FRP repairs completed within three weeks; contractor highly pleased with the thorough FRP engineering support from Simpson Strong-Tie.

**THE SOLUTION** Strengthen cracked CMU after anchoring walls back in plane



The wall was moved back into plane, and connectors were placed at the top of the wall.

After the walls were repositioned vertically and anchored in place, the next step was to repair and reinforce the CMU where it was cracked. Utilizing a fiber-reinforced polymer (FRP) retrofit solution made sense from both a strength and an expense standpoint. Since the reinforcement was to be installed on the outside of the building, a low-profile solution was also preferable.

Once an FRP design was decided upon, two factors made Simpson Strong-Tie the most logical choice for

the job. First, our glass-fiber polymer fabric was ICC-ES listed, unlike competitors' similar products. Second, the Engineer of Record was familiar with the Simpson Strong-Tie complementary engineering support in the FRP market. Simpson Strong-Tie representatives visit Anchorage at least 10 times a year, supporting the market with engineering services and training. Our workshop, in September 2019, attracted 24 local engineers, including members of the US Army Corps of Engineers and US Air Force Civil Engineer Support Agency.

It was determined that the strengthening solution would consist of applications of Simpson Strong-Tie CSS-CUGF27 code-listed unidirectional E-glass fabric, bonded with CSS-ES saturant resin, to both the inside and outside faces of the walls.



Plane deflection of the wall at the roofline, showing how critical the damage was.

**THE RESULTS** YMCA facility reopens exactly one year after earthquake, in time for a scheduled event

The FRP portion of the repair job was completed in three weeks, despite the cold-weather challenges. Which meant the facility was able to open exactly one year after the earthquake, in time to host the YMCA Earthquake Classic basketball camp the weekend after Thanksgiving.

The installation contractor for the project, Aaron McLaughlin of DAMA Industrial LLC, had this to say about working with Simpson Strong-Tie:

*...thank you and all the Simpson Strong-Tie folks for your help on this job. This was the most enjoyable FRP project we've ever had, and that's in large part because of the excellent start-to-finish service you guys provided. We're looking forward to working with you folks on many more projects.*

**Simpson Strong-Tie Can Help**

We recognize that specifying Simpson Strong-Tie® Composite Strengthening Systems™ (CSS) is unlike choosing any other product we offer. Leverage our expertise to help with your FRP strengthening designs. Our experienced technical representatives and licensed professional engineers provide complimentary design services and support — serving as your partner throughout the entire project cycle.



Interior view of FRP installation in progress, showing the vertical strips and spacing needed to retrofit the gym.

**MORE  
INFO**

For complete information regarding specific products suitable to your unique situation or condition, please visit [strongtie.com/css](http://strongtie.com/css) or call your local Simpson Strong-Tie RPS Specialist at **(800) 999-5099**.