

## RenewWrap FRP with EZ-Slit employed to reinforce Nicaraguan bank structure

### BACKGROUND

A large building was in the process of being constructed when a 6.1 magnitude earthquake struck. Following inspections, cracks and other structural issues were discovered that needed to be addressed before the remaining construction could take place.

### SOLUTION

The engineering firm, Llansa Ingenieros, was engaged to inspect the building post earthquake and identified several issues that needed to be addressed. Already familiar with the use of FRPs, Llansa Ingenieros leaned toward their use due to the relatively low impact to the existing structure while providing the required reinforcement to ensure that any damage was mitigated. CPS, a regional sales agent for GeoTree Solutions' RenewWrap FRP system, had a previously relationship with Llansa and aided in educating them about the specifics required for each defect repair. Not only a material supplier, GeoTree also took on the role of finalizing the required engineering details with their partner engineering firm.

The contractor for the project was ECAST, a local company that did not have experience installing FRPs. GeoTree worked with the engineering firm, ECAST, and CPS to ensure that all parties were fully educated on the process prior to onsite application of materials. The training was conducted in Spanish such that there was no miscommunication, and GeoTree's technical expert Todd Lyda was on site during installation to provide hands-on support and training.



RenewWrap EZ Paste applied



### PROJECT DETAILS

**Application:** Structural strengthening of mezzanine slabs and beams

**Client:** Banco Centro Americano de Integración Económica (CABEI)

**Location:** Managua, Nicaragua

**Engineering Firm:** Llansa Ingenieros

**Contractor:** ECAST

**Field Support:** GeoTree Solutions

**Date of installation:** 2021/2022



Outside of building



Cracked and spalling concrete

# RENEWWRAP®

Fiber Reinforced Polymers



During the application, the installation crew faced several challenges, the most predominant being the high humidity and temperature. Incorrect management during the application process could lead to poor quality due to materials hardening before placement on the repair location. To resolve this LPL resin was used to saturate the FRP material as it provides a longer working time in a high humidity environment.

The repair process involved clearing out the cracks and spalling areas before applying RenewWrap EZ Paste. This filled the bug holes and imperfections to the concrete creating a stable substrate.

ECAST applied 4800 sqft of RenewWrap CF600 complete with EZ-Slit functionality. EZ-Slit allowed the contractor to make cuts in the material at 6" and 12" intervals without being concerned with the fraying that occurs with FRP materials from other suppliers. EZ-Slit delivers better efficiency, improved quality, and less waste.



*RenewWrap installation*



*RenewWrap EZ-Slit FRP - cut to size      Ready-cut widths of RenewWrap in place*



*RenewWrap Anchors*

This was used alongside RenewWrap EMBED anchors which were pre-cured for insertion into the drilled holes. This pre-curing allows for smaller holes to be drilled into the concrete which in turn reduces the epoxy usage during embedment. By being pre-cured, the anchors allow quicker placement, proper splaying of the fiber bundled, and ultimately speeding installation.

