



National University College, Arecibo Campus Parking Structure

## NATIONAL UNIVERSITY COLLEGE

Structural Repairs on the Arecibo Campus Completed Months Ahead of Schedule

**Property Owner:**

Eduk Group, Inc. (Puerto Rico, MX)

**Concrete Contractor:**

AT Specialty Cements & Polymer Technologies (San Juan, CA)

**Products:**

V/O Repair Mix®, Mortar Mix®, Cement All®, and WunderFixx®

### FAST SET TIMES ENABLE CONCRETE REPAIRS DURING WINDY CONDITIONS

National University College in Puerto Rico has five campuses conveniently located throughout the island. The Arecibo campus sits just 50 feet from the Atlantic Ocean. Being this close to the ocean means the facility is subject to strong winds and corrosion. As a result, the campus parking structure was in dire need of structural repairs.

In April 2016, the university's advisory group and property owner, EduK Group, Inc., contracted AT Specialty Cements & Polymer Technologies of San Juan to repair the 800-cubic-foot (86-square-foot) covered parking lot. EduK was looking for a permanent, durable solution that could withstand the corrosive seaside environment and be installed quickly — within five months.

The contractor used CTS Cement's Rapid Set® family of products to provide quality repairs in a short time frame. In particular, V/O Repair Mix® was chosen because it contains a corrosion inhibitor and fibers. Other products used include Mortar Mix®, Cement All® grout, and WunderFixx® concrete patching compound. These fast-setting materials also allowed the contractor to perform the bulk of repairs before daily high-wind conditions set in.

### FULL-DEPTH REPAIRS IN A SINGLE COAT

A structural engineer inspected and found more damage than expected on the parking structure's beams and columns. This was due, in part, to insufficient concrete coverage on the beams' bottom reinforcement bars. The solution was to use both partial-depth and full-depth concrete repair methods with rebar replacement. Because the Rapid Set products can be applied at thicknesses up to six inches, the repair crew was

able to apply the repair materials at full depth in a single coat, allowing for quicker repair times.

For partial-depth repairs, the crew removed the top one-third of damaged slabs and replaced it with V/O Repair Mix. The high-performance, polymer-modified blend of hydraulic cement, additives and specially graded fine aggregates bonds well with existing concrete and is corrosion-resistant. The repair material is ideal for general concrete repair, resurfacing, mortar beds, and vertical and overhead applications where rapid strength gain, high durability and low shrinkage is required.

The contractor used Mortar Mix for all full-depth repairs. Used for vertical and overhead applications, the high-performance blend of hydraulic cement and quality sand is durable in wet environments, sets in 15 minutes and is ready for traffic in one hour. However, because work took place during temperatures that ranged in the mid-80s, the crew added one packet of SET Control® and three packets of FLOW Control® to every 55 pounds of Mortar Mix to keep the material from setting too fast. The SET Control additive slows setting times during warmer temperatures while Flow Control increases fluidity of the mixture. Additionally, replacing water in the mix with FLOW increases strength and reduces shrinkage.

## WORKING AROUND THE WIND

The crew also had to work around the sea breeze — strong ocean winds that threatened to blow material around. For example, while performing partial-depth repairs, the crew mixed and placed the V/O repair material in the early morning hours, during which they experienced the most favorable wind conditions. The material was placed by 9 a.m. each morning, when the wind typically changed directions and grew stronger. Because V/O Repair Mix contains cutting-edge self-curing technology, it does not need to be wet-cured in most applications. The material sets in 45 minutes and is ready for loading in two hours.

By using fast-setting concrete repair materials, AT Specialty Cements was able to schedule work around the wind and complete all repairs months ahead of schedule, which resulted in profits for the contractor as well as cost savings for the owner. EduK saved two months of payments on a rented parking lot for students and staff during construction.



The campus sits 50 feet from the Atlantic Ocean and is subject to strong winds and corrosion



The crew removed the top damaged slabs and replaced it with V/O Repair Mix.



The repair material is ideal for vertical and overhead applications.