

Jetway Bridge Braced for 150 mph Winds with Helical Tieback Anchors™

South Florida



Airport terminal improvements included the addition of new passenger boarding jetways at a commercial airport in southern Florida. The new bridges were factory designed to withstand winds up to 90 miles per hour. The engineers determined that supplemental tiedowns were required to boost the wind resistance to withstand hurricane force winds of 150 miles per hour.

The engineers of The LPA Group investigated several methods of securing the jetway bridges. One plan used very large, heavy concrete pads with a hook and chain system for resistance against the high wind loads. A less costly method was offered to the

engineers by N Square, Inc. They suggested using Torque Anchor™ tiebacks in place of the heavy reaction blocks constructed from concrete. The design proposed by N Square, Inc installed screw piles to an average embedment length of 35 feet to satisfy the 150 mile per hour wind resistance requirement. N Square, Inc. worked closely with Forge Engineering, Inc. to design a specially manufactured connection to couple the Torque Anchor tiebacks to the tie down cable eyes.

Project Summary	
Project:	Passenger Terminal Bridge Tie Down Anchors
Engineers:	The LPA Group, Inc. Forge Engineering, Inc.
Installing Contractor:	N Square, Inc. P.O. Box 113040, Naples, FL 34108 www.southernfloridafoundationrepair.com
Products Installed:	TAF-175 Torque Anchor™ Tiebacks 1-3/4" sq. shaft - triple 14" diameter helical plates
Number of Placements:	4 Tieback Anchors
Embedment:	30 to 40 feet
Ultimate Capacity:	45,000 pounds



The soil on the site consisted of four feet of fill that contained rock fragments. The fill was underlain by strata of sand and silty sand.

The concrete pavement was cut and removed to provide access for the anchors and to fabricate concrete pads for Neenah R-2495 frames and covers that were required to protect the tie down connections from vehicle traffic. The Torque Anchor™ tiebacks were installed at a batter angle of 30° from vertical oriented toward the direction of the expected winds. The anchors were embedded into the silty fine sand at consistent shaft torsions of 4,500 to 4,700 foot-pounds to achieve the ultimate tensile design capacity.



The photographs above and on the previous page show the installation of the ECP Torque Anchor™ tiebacks at one of the new passenger jetways. The tieback anchor configuration consisted of three 14 inch helical plates attached to a 1-3/4 inch high strength square shaft. The anchors were advanced into the soil using a 12,000 foot-pound hydraulic gear motor shown mounted to a mini-excavator's dipper arm.



The entire project took only two days to complete. Once the tiebacks were installed, inspected and accepted; the attachment couplings were installed. Finally, the access frames were cast into a new concrete pad and covers were installed to complete the project. N Square's proposal to use helical screw piles resulted in a substantial savings to the customer and delivered the finished product in about one-third the time of the alternate cast concrete block design.



ECP Torque Anchors™

Earth Contact Products, LLC.

"Designed and Engineered to Perform"