



MARKET APPLICATION FOCUS

Transportation
Cantilevered Concrete Runway
Structural Strengthening

Project: La Guardia Airport
Owner: The Port Authority of New York and New Jersey
Specifier: The Port Authority of New York and New Jersey
Contractor: John P. Picone, Inc.
Year: 1998 - 1999

THE PROBLEM

During the 1960's, LaGuardia Airport's two intersecting runways were extended into Riker's Island Channel to accommodate larger planes and higher traffic. The cantilever portion of this runway system was reserved for light passenger jets (i.e. 727), while the remaining areas were used for larger capacity jets (i.e. 747).



During the past two decades there has been a substantial increase in air traffic into the New York City area, requiring the cantilever portion of the airport to be upgraded to meet the loading requirements of the larger capacity jets. The cantilever runway is constructed of precast two-way prestressed slabs spanning across concrete precast longitudinal girders on concrete piles. The results of the structural analysis indicated that although the slab and girders were sufficient to handle the higher load requirements, the piles were not.

THE SIKA SOLUTION

The decision was made by the owner to reduce the load on the existing piles by adding new piles and girders between each column line, effectively cutting the load at each pile in half. In order to drive the new piles, 2-foot diameter holes were cored into the slab while precautions were taken not to cut the prestressing steel in the concrete deck. However, the slabs also contained mild reinforcing that could not be avoided due their tight spacing. To compensate for this loss of reinforcing, two 10 foot long Sika CarboDur S512 CFRP (carbon fiber reinforced polymer) strips were applied to each side of the hole location prior to coring the holes. Since the runway cantilevers over Flushing Bay, this project was particularly challenging for the contractor, since he had to work from scaffolding erected on a floating barge. Despite making frequent adjustments to the scaffolding height, he was able to install 400 feet per crew in an eight-hour shift. A total of 341 holes were cored, consuming over 13,000 linear feet of Sika CarboDur strip.



CASE STUDY



For Transportation Structures... Sika's System approach to Concrete Repair and Protection

Anti-Corrosion Primer and Bonding Bridge

Sika Armatec® 110 EpoCem® - protects the steel from corrosion in areas of inadequate cover. Improves bond of repair mortar to both substrate and steel.

High Performance Repair Mortars

SikaTop® Plus mortars - two component polymer modified materials containing Sika FerroGard 901 corrosion-inhibiting admixture.

Corrosion-Inhibiting Impregnation

Sika FerroGard® 903 - spray-applied to protect areas outside the repair zone against future damage. Proven to penetrate and reduce corrosion effects of carbonation and salt exposure.

Surface Leveling/Pore-Filling Mortars

SikaTop® leveling mortars - achieve a level surface by filling pores, bugholes, or other irregularities in the surrounding substrate.

Anti-Carbonation Coatings

Sikagard® 550W and 670W - protect concrete facades from the damaging effects of carbon dioxide (carbonation), water and pollutants. Either crack-bridging (550W) or rigid (670W), both are available in a variety of decorative colors.

Joint Sealing/Waterproofing

Sikaflex® High Performance Sealants - premium-grade polyurethane joint sealants that are fully compatible with Sika's concrete repair systems.

Epoxy Injection and Bonding

Sikadur® epoxy resins help restore structural integrity by injection of cracks and voids. The most comprehensive range of epoxy products for structural bonding and grouting.

Structural Strengthening Systems (FRP)

Sika CarboDur® & SikaWrap® - a proven system of external strengthening using carbon fiber laminate strips, carbon fiber fabric, and glass fiber fabric. Stronger than steel yet lightweight and non-corrosive, these system components can solve unique strengthening problems in a variety of concrete structures.



Contact Sika At:
Phone: 1-800-933-SIKA NATIONWIDE
Internet: www.sikausa.com
Fax Back: 877-663-9727

Sika Corporation (USA)
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: 201-933-8800
Fax: 201-933-6225

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Corregidora, Queretaro
C.P. 76920 A.P. 136
Phone: 52 42 25 0122
Fax: 52 42 25 0537



Sika Canada, Inc.
601 Delmar Avenue
Pointe Claire,
Quebec H9R4A9
Phone: 514-697-2610
Fax: 514-694-2792