



CASE STUDY

MARKET APPLICATION FOCUS

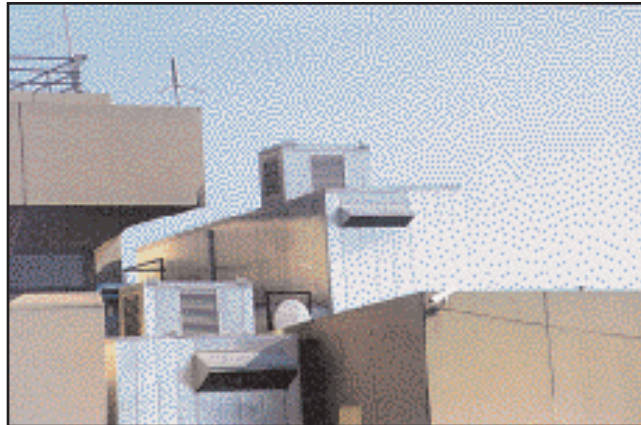
Transportation

Strengthening Cast-In-Place T-Beams

CFRP

Project: Building 10
Emergency Rescue
Newark International Airport, Newark, NJ
Owner: The Port of Authority of New York and New Jersey
Specifier: The Port of Authority of New York and New Jersey
Year: 1997

THE PROBLEM



Building 10, which houses the fire and police emergency units at Newark Airport needed a new air handler unit (AHU). This larger, heavier unit was to be installed on the roof of the vehicle garage. The original construction consisted of cast-in-place joists with a monolithic concrete slab roof. Although the capacity of the joists allowed for the additional weight of the AHU, the added drifting snow load created by the height of the AHU could not be safely supported.

THE SIKA SOLUTION

Several scenarios were considered for strengthening the roof joists which included conventional strengthening methods as well as externally bonded CFRP (carbon fiber reinforced polymer) laminates. After carefully evaluating the available options the owner chose to strengthen the joists using Sika CarboDur CFRP strips. The strips were chosen for their ability to be installed quickly, in congested areas, as well as being maintenance-free. Each joist was strengthened with one 4" wide x .048" thick strip bonded to the tensile face of the beam using Sikadur 30 epoxy to supplement the existing tensile reinforcing. Each 4" strip is capable of resisting a 65 Kip tensile force.



The strips were applied from a scissor-lift in one day, including surface preparation. The substrate was prepared using a needle scaler to achieve a clean open pore texture. Once the preparation was completed the strips were cleaned using a methyl-ethyl-ketone (MEK) solvent. A primer coat of Sikadur 30 epoxy was then applied to the substrate, followed by a 2mm thick layer applied to the strip. The strip was then pressed into place using finger pressure and rolled to ensure proper seating using a hard rubber roller. Due to the thixotropic properties of the epoxy, no clamping or shoring of the strip was required. A total of 16 beams were strengthened and are now in compliance with applicable code requirements.



For Concrete Buildings... 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 if inadequate cover. Improves bond of repair mortar to both the 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 Levelling/Pore-Filling Mortars

SikaTop® levelling 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.

Crack-Bridging Deck Coatings

Sikafloor® Traffic Systems - protect decks, ramps, grandstands, and walkways with a durable wearing surface which waterproofs and prevents chloride ingress.

Joint Sealing/Waterproofing

Sikaflex® , High Performance Sealants - are 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 into cracks and voids. The most comprehensive range of epoxy products for structural bonding and grouting.

Structural Strengthening Systems (CFRP)

Sika CarboDur® - 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.

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