



CASE STUDY

EVANS HALL

Owner: University of California, Berkeley, Berkeley, CA

Project Engineer/Designer: Degenkolb Engineers, San Francisco, CA

Repair Contractor: Valentine Corp., San Rafael, CA

Material Supplier/Manufacturer: Sika Corporation, Lyndhurst, NJ



ICRI Award Winner
Award of Merit
Longevity Category

BUILDING TRUST



Background

Evans Hall is a 10-story building that houses the departments of statistics, economics, and mathematics at the University of California, Berkeley. The Building was constructed in 1971 and named after the chairman of mathematics from 1934 – 1949, Griffith C. Evans. Evans Hall has been paramount in many technological advances especially when it served as the hub for the West Coast's internet access at the beginning stages of development. Evans Hall is used by thousands every semester making this project very important to life on campus.



Honeycombing due to segregation of material

In 1999, safety concerns were raised regarding Evans Hall due to pieces of concrete falling from the building's façade. Poor initial concrete placement and concrete coverage over rebar combined with CO₂ and salt penetration from the San Francisco Bay air led to accelerated corrosion of the building's rebar. The entire exterior façade concrete was plagued with large spalled areas, bug holes, and honeycombing. The building also sits on a major seismic fault-line which further spurred the need for restoration.



Spall revealing low cover on rebar

The Sika Solution

Work on this building proceeded in two phases. The first phase of this project consisted mainly of spall repair and exterior concrete façade leveling. The concrete around any exposed metal was removed to the correct depth, cleaned of all signs of corrosion, and coated with an anti-corrosion coating Sika® Armatec® 110 specifically formulated to act as a bonding agent before any mortar was applied. The larger vertical spalls were repaired with a flowable polymer modified mortar SikaTop® 111 Plus. For the smaller spalls a polymer-modified, hand-applied mortar SikaTop® 123 Plus was used. A parge coat of Sika® MonoTop® 615 was sprayed on the entire surface of the building to achieve a level, contiguous surface by filling bug holes and air pockets and to increase the level of air tightness allowing for more efficient heating and cooling. This parge coat was then troweled and sponged to achieve a uniform yet sandpaper-like surface for better adhesion of the elastomeric top coat. In the second phase, a coat of Sikagard® 552W primer was applied to aid in the adhesion of the elastomeric top coat Sikagard® 550W Elastocolor as well as to seal the exterior surface against water ingress. However, before the elastomeric top coat was applied, a low modulus, polyurethane-based elastomeric sealant, Sikaflex® 15LM was applied to areas around windows, doors, and flashing to ensure waterproofing. Pigments were added into the coating to match the blues, greens and greys of the surrounding hills and bay area.



Form being put in place around surface prepped column

Sikadur® 22 Lo-Mod - an epoxy resin that provides a hard wearing, slip resistant wearing surface. This overlay system seals the concrete and provides waterproofing protection.

Sika® FerroGard® 903 - as a dual action corrosion inhibitor, will reduce corrosion currents by penetrating through the concrete and forming a protective coating on the embedded steel bars.

Sikagard® 550W Elastocolor 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 high-performance protection coatings, available in a variety of decorative colors.

Sika® Armatec® 110 EpoCem® - protects rebar in areas of inadequate cover.

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

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.

Sikaflex®-15LM - High-performance, low-modulus elastomeric sealant for high-rise and facade applications where high movement capability is required.

Sika Monotop® 611 - one component, polymer-modified, silica fume enhanced, cementitious pump and pour mortar