# ICRI 2007 Project Award Winner
# Award of Merit: Special Projects Category

## Arizona State University Sun Devil Stadium Repairs

**Owner**
Arizona State University
*Tempe, Arizona*

**Project Engineer/ Designer**
Gervasio & Associates, Inc.
*Phoenix, Arizona*

**Repair Contractor**
Restruction Corporation
*Sedalia, Colorado*

**Material Suppliers/ Manufacturers**
BASF Building Systems
*Shakopee, Minnesota*

Sika Corporation
*Lyndhurst, New Jersey*

Sun Devil Stadium, in Tempe, AZ, recently underwent significant structural repairs due to corrosion-related deterioration. This corrosion was caused by moisture infiltration into structural elements from the frequent “washdown cleaning” of the stadium after events.

While evaluation revealed significant damage hidden within the structure, most of the problems were discovered during the renovation:

- The loss of over half of the top flange thickness on steel beams encased in concrete;
- Prestressed strands in hollow-core plank had completely corroded away;
- Steel shelf angles supporting hollow-core plank had lost over half the thickness at the point of critical moment;
- Steel ledger angles supporting floor slabs had completely corroded away;
- Cantilevered floor slabs had failed due to overload and corrosion; and
- Floors for concession stands were added without reinforcing the steel beams, which subsequently deteriorated from corrosion.

Emergency repairs were initiated on a 24/7 basis. Repairs included:

- Installing steel beam cover-plates with a jacking system suspending the beam and floors from the structure above;
- Strengthening with carbon fiber rods and fabric;
- Repairing hollow-core concrete plank where tendons had completely corroded away;
- Supporting seating riser floor slabs with polyurethane foam soil-stabilization grout; and
- Shoring through span shortening and external post-tensioning.

A high level of protection against future corrosion was provided by coating the structural steel with epoxy, epoxy flood-coating the concrete surfaces, and urethane deck coating. Most repairs were completed in summer conditions, when temperatures approach 115 °F (46 °C) daily.