



PROJECT PROFILE

Sun Devil Stadium

Lifting of Concourse Level | Tempe, AZ



CLIENT

Restruction Corporation and
CORE Construction

BACKGROUND

The 72,000 spectator capacity Sun Devil Stadium at ASU is a large, U-shaped structure with lower and upper stands. The stadium was built in 1976 and upgraded in 1988. It features precast concrete bleachers supported by steel girders and beams on steel concrete columns. The concourse level below the upper stand is a topped, hollow core deck supported on steel brackets welded to floor beams. The concourse is located between 30 and 60 feet above ground level.

After forty years of service, the top flanges of the beams and brackets supporting the concourse decks and the degrees of the concrete decks had developed significant corrosion. Repairs, designed by others, included lifting the concourse decks from their supporting steel beams using shoring structures to ground. WJE was retained to consider the feasibility of using the upper stand steel frames to lift the concourse level using tension assemblies and hydraulics while minimizing disruption to the stadium operations, in particular at ground level and kitchen areas.



SOLUTION

WJE engineers performed a document review and structural analysis of the steel frames supporting the upper and lower stands. The upper stand structure was determined to have sufficient capacity to lift the concourse decks. Steel brackets were welded to the steel girders of the upper deck, and tension cables were hung to the concourse level. There, portable hollow structural steel tubes and hydraulic jacks were used to couple steel saddles installed under the concourse framing. Controlled lifting of the concourse decks was accomplished with calibrated hydraulic rams and loaded cells.



Disruptions to stadium operations on the concourse level were minimized, and the grounds and kitchens remained open at all times.