



PROJECT PROFILE

Soldier Field Stadium

Corrosion Mitigation Testing for Historic Concrete Elements | Chicago, IL



CLIENT

Chicago Park District

BACKGROUND

Soldier Field is home to the National Football League's Chicago Bears. The stadium was originally constructed in the 1920s and was later named and dedicated as a memorial to fallen American soldiers. The main girders in the stadium's Grand Concourse were constructed as part of the original structure using a concrete mix of relatively low strength and high permeability. As a result primarily of concrete carbonation, these members have been subject to extensive reinforcing steel corrosion and concrete spalling. The concrete coffered ceilings of the colonnades have experienced similar deterioration due to high chloride ion concentrations attributed to the use of chloride-containing additives during original construction.

As a result of reinforcing steel corrosion, portions of the stadium developed significant concrete distress. Mitigating the potential hazard of spalling overhead concrete requires regular inspections. In conjunction with an extensive renovation and partial reconstruction of the stadium, the Chicago Park District wanted to evaluate various corrosion mitigation schemes to ensure long-term protection of the historic concrete elements to remain in the rebuilt stadium, including the main girders over the Exhibition Hall and the coffered ceilings of the colonnades.

SOLUTION

Based on extensive experience with corrosion-related concrete distress, WJE selected several corrosion mitigation techniques and implemented trial installations in the field. These included spray-applied and admixed corrosion inhibitors; realkalization; arc-sprayed zinc in a passive cathodic protection system; and mechanically attached zinc sheets and discrete zinc anodes in a passive cathodic protection system.

WJE installed corrosion probes and performed nondestructive testing to evaluate the performance of each approach. This information was then used to make predictions regarding long-term performance and life-cycle costs. WJE also provided recommendations for repair of the historic concrete elements.

