Case Study: Addressing Non-structural Cracks with Hydrophobic Polyurethane Injection / SEALBOSS

Location: Berlin Reservoir Spillway, Kansas City International Airport

Contractor: GKW Group

Engineering Firm: on request

Objective: Address visible water intrusion in cracks and joints.

Materials Utilized: SEALBOSS 1510, 15x

Tools Employed: SEALBOSS 13-100AL Evo 1/2" packers, SEALBOSS P2002 Injection Pump, Hammer Drill with a 12" x ½" bit, Generator, spray bottle, and PPE.

Project Synopsis:

Background:

The Berlin Reservoir Spillway at the Kansas City International Airport required a comprehensive restoration and rehabilitation. The GKW Group, a renowned contractor, was commissioned to undertake approximately 60 feet of chemical grouting as a significant component of this project. The primary task was to address compromised concrete areas, ensuring they were thoroughly cleaned, patched, and re-caulked.

Challenge:

Cracks and joints in the spillway structure exhibited clear signs of water infiltration, often accompanied by efflorescence, indicating past moisture issues. The primary source of this water intrusion was rain runoff, which resulted in the oversaturation of the adjacent built-up and back-filled sections.

Solution:

The engineering firm overseeing the project recommended the use of a moisture-activated hydrophobic foam for injecting the affected areas. Once the custom scaffolding was set up, GKW Group's certified team employed the SealBoss P2002, a portable high-pressure injection system. This equipment is designed to inject at pressures sufficient to counteract the hydrostatic pressure within the wall, effectively displacing the moisture.

Considering the wall's thickness of approximately 12 inches, the 13-100AL Evo packers were strategically positioned by drilling directly into the cracks. This method was chosen based on the concrete's quality, aiming to minimize potential spalling due to the injection pressures.

Execution:

The injection process spanned a total of 8 hours. Each packer underwent reinjection to ensure a comprehensive seal. In several instances, the injected material traveled through honeycombed sections of the concrete, reaching areas several feet away from the initial injection point. Whenever this occurred, the injection was momentarily halted until the material cured. This pause ensured that subsequent injections would follow a new path of least resistance within the crack structure's capillaries.

Outcome:

The team successfully halted the water intrusion within a single day. This efficiency meant that the reservoir could be restored to its regular levels much quicker than initially anticipated, with a provision for potential spot treatments in the future if necessary.

Conclusion:

This case study underscores the importance of timely intervention and the utilization of advanced techniques in addressing non-structural cracks, ensuring the longevity and functionality of critical infrastructure.

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