



## PROJECT PROFILE

# Commerce Center

Investigation of Floor Slab Distress | Scottsdale, AZ



### CLIENT

iStar Financial, Inc.

### BACKGROUND

The Commerce Center is a multi-tenant, 103,550-square-foot, single-story building that can be utilized as office, warehouse, or office/showroom space. It was constructed around 2008 but was not occupied until years later, when a tenant moved into a portion of the building.

Isolated concrete pop-outs were discovered in the surface of the soil-supported concrete slab during tenant finish out. While the distress was not operationally significant to the first tenant, leasing to subsequent tenants required that the cause of the distress be understood and that the slab be repaired or replaced, depending on future occupancy.

During preparations for the original tenant finish out, concrete slab surface distress was noted by the owner. This distress included localized delamination, spalling, and pop-outs at thousands of locations associated with white deposits and exudations from within the concrete. WJE was retained to investigate the reported slab distress, determine if the condition was ongoing and likely to continue, and provide recommendations for repair.

### SOLUTION

WJE performed a visual survey of the building slab. Samples of the exudations were gathered, concrete cores were extracted, and soil samples beneath the slab were obtained. These samples and cores obtained by the owner previous to WJE's investigation were examined at WJE's Janney Technical Center in Northbrook, Illinois. Samples of the exudate were analyzed using a scanning electron microscope equipped with an energy dispersive x-ray spectrometer (SEM/EDS) to assess composition.

The concrete floor slab was found to exhibit signs of distress related to excessive amounts of sodium-potassium silicates in the near-surface region of the concrete slab, due potentially to an incorrectly applied surface hardener/densifier. These accumulations led to excessive stresses in the top surface of the concrete, resulting in pop-outs and exudations.

Options for repair and replacement were given to the client and portions of the slab were replaced, while some areas were repaired locally. WJE was asked to return to the site after replacement for an updated visual assessment of the floor slab.

