



PROJECT PROFILE

City Vista Garages

Post-Tensioned Slab Evaluation | Pittsburgh, PA



WJE No. 2016.4271
Sample ID CORE 4-F-2



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Scale (in.)

CLIENT

Preferred Apartment Communities, Inc.

BACKGROUND

The complex, originally constructed during the winter of 2013, includes three two-level parking structures (garages at Buildings 2, 3, and 4) and a site retaining wall. The parking structures contain a slab-on-ground base floor level and a post-tensioned elevated (and uncovered) first-floor slab level. Soon after construction, cracks became visible on the elevated slab. These cracks were repaired; however, the cracking continued and water infiltration into the base level was reported in all three garages.

Cracks through the elevated post-tensioned slab construction were allowing water to leak through to the ground-level parking areas. WJE was retained to determine the cause of the cracks through the post-tensioned slab construction and recommend repair options.

SOLUTION

WJE reviewed original construction documents, observed on-site conditions, and performed petrographic studies on several concrete core samples extracted from the elevated post-tensioned slab. Petrography indicated that the full-depth cracks through the elevated slab formed after the concrete developed a firm bond between the paste and the aggregates. Additionally, crack mapping of elevated slab conditions suggested one-sided restraint of two of the three garages. The crack patterns were consistent with the location of a lower-level retaining wall at the two affected garages. WJE concluded that the lower-level retaining walls were causing restraint of the elevated slab, which did not allow for adequate transfer of the post-tensioned forces. Repair recommendations were provided to repair cracks and reduce the amount of water leakage to the lower level of the garages.

