



## 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 to 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 to reduce the amount of water leakage to the lower level of the garages.

