A Pictorial Description of a Shotcrete and Precast Parking Garage Construction

by Chris Zynda

Joseph J. Albanese, Inc., recently built a four-story parking garage using shotcrete and precast beams, columns, and architectural walls. The project was completed in record time with shotcrete.

Shotcrete was used throughout the project, starting with the original shoring needed, the structural shearwalls, and the 30 ft (9.1 m) high retaining walls. The first step was to excavate for the new structure. This was done in 5 ft (1.5 m) lifts with a soil nail shotcrete wall.

Shows excavation and 6 in. (150 mm) thick shotcrete shoring completed when the project was ready for a mat slab. With the mat slab completed, the scaffolding could go up and the next 8 in. (203 mm) thick layer of shotcrete could be installed. The new 8 in. (203 mm) thick layer was reinforced and tied to the dowels left from the first 6 in. (50 mm) thick shoring system. The existing 6 in. (150 mm) shoring was left with a rod finish and completely sandblasted in preparation for the final 8 in. (203 mm) thick reinforced shotcrete wall. Prior to the new shotcrete wall being installed, the existing shotcrete surface was water-blasted and brought to a saturated surface-dry (SSD) condition (this being the most important step for proper bond)

When the 14 in. (355 mm) thick, 4000 psi (28 MPa), 30 ft (9.1 m) high wall (using a two-layer shotcrete system) was complete, the precast beams could be placed

View of the precast columns shipped from the factory with roughened sides and pre-drill dowels ready for connection to the new shotcrete shearwall

Completed 4000 psi (28 MPa) sand float finish walls (installed by the shotcrete process)

Placing the second floor deck

Completed basement-level shotcrete walls ready for waterproofing and structural backfill

View of the completed walls and pilasters (constructed using shotcrete as the placement technique)

Precast beams, shearwalls, and retaining walls complete and ready for deck forming and reinforcing

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