SPRING 2011

The Towers Condominiums

ICRI Minnesota Chapter — Project Spotlight

Owner: The Towers Condo Association

Contractor: Restoration Systems

Engineer: Meyer, Borgman and Johnson, Inc.

The primary scope for The Towers Condominiums 2010 restoration was to repair overhead delaminations at the entrance ramp to the below-ground parking and vertical delaminations at the adjacent walls and barrier walls. The approximate area of partial-depth overhead spalls and delaminations (Image 1) was estimated at 2,500 square feet and the area of partial-depth vertical delaminations was estimated at 130 square feet. The timeline for work was 4 weeks and the ramp was to remain in operation during construction.

The ramp slab was coated with a waterproofing and had a topping slab with radiant heat, making a core and grout application impossible. The construction originally designed to be hand-patched with overhead repair mortar. During the bidding process, many contractors suggested using shotcrete to save time and money. An alternate for using shotcrete was provided and shotcrete was included in the winning bid.

The shotcrete mixture was provided by TCC Materials and included fly ash and silica fume in addition to the cement. The mix required a maximum water/cementitious ratio of 0.35. The project was divided into 2 phases, 1 phase for each lane of the ramp. A portable traffic signal and traffic signs were used to control traffic during the work and personnel from the Towers assisted in directing "rush hour" traffic in the morning and evening.

Overhead spalls and patches were hammered with very little of the reinforcing steel requiring replacement (Image 2). The shotcrete was applied in multiple lifts to the finished thickness (Image 3). Special inspection and observation was provided by American Engineering Testing (AET) and the Engineer during construction. The finished concrete was to be finished to "closely" match the adjacent formed surfaces (Image 4).

Three months following installation, the patch material was required to be tested for bond. The owner hired AET to test the bond using small cores between the reinforcing bars. None of the samples broke at the bonded plane between the patch material and base concrete. Observation of the patches revealed only one shrinkage crack after three months. All was approved as installed to the satisfaction of the Owner and Engineer.

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