2014 Honorable Mention

Alameda Square

By Paul Mendoza

Alameda Square is an historical industrial complex in the Fashion District of Downtown Los Angeles, CA. This hub, built in the 1920s, will place a community of creative companies at the intersection of the Los Angeles Fashion and Arts Districts. The owner, Atlas Capital Group, LLC, is revitalizing Alameda Square and leasing the stylish and practical space to several fashion tenants who are dedicated to American clothing manufacturing.

Fig. 1: An opened area showing the tile insulation and exposed existing reinforcing bar at the joists

Fig. 2: This is a prepped area prior to shooting; sound existing reinforcing bar was left in place and reinforced with new reinforcing bar and dowels. The edge form was set to bind the sides of the joist infill

Alameda Square Building 3, constructed entirely with reinforced concrete, at one point in its history was used as a deep-freeze facility by a food packaging company which had insulated portions of the concrete slabs and beams with cork and clay tiles. The years of exposure to freezing-and-thawing conditions caused spalling on the interior beams, concrete joists, and slabs; spalling was also evident on the exterior architectural concrete face of the building (refer to Fig. 1). The building was later repurposed as a garment manufacturing facility and still functions as such today.

The objective of this rehabilitation was to chip out spalled and deleterious concrete, remove and repair corroded reinforcing bar, and restore these areas with new shotcrete to prevent potential safety hazards from further spalled concrete and return the building concrete structure back to its original strength and function (refer to Fig. 2).

Several areas were identified as requiring rework and were repaired. The superior ability of shotcrete to bond in the overhead application made it a more viable alternative to typical cast-in-place concrete, an important factor to consider for structural rehabilitation of the building. By using shotcrete for the interior ceiling repairs, an added benefit for the tenant/owner was the ability to contain the area shutdown for construction to the floors with repairs, as opposed to cast-in-place that would have required shutting down commercial activity on additional floors because the work on a particular floor would require pumping concrete from the floor directly above the repairs. In addition, choosing shotcrete reduced construction forming time and materials. Also, because shotcrete can be applied and finished more quickly, the project schedule was shortened. To complete the work, the owner shut down three floors of the warehouse building at a time. Once the shotcrete work was completed, they were able to immediately move in their tenants and then shut down the next three floors above. Each day of downtime cost the owner productive revenue.

Fig. 3: The final shotcrete rod finish minimized the amount of work at the face

Fig. 4: A core taken from an in-place test panel. Note near the top is a faint red line—this is the tile layer seen in previous photos. In the 13 in. (330 mm) thick overhead section, ACI Certified Nozzlemen were able to achieve a solid bond without any separation between the new shotcrete and existing material. Due to the length of the core, it was not possible to drill through the length without breaking during the extraction

Thus, minimizing the out-of-service periods was crucial to the project's budgetary concerns. The shotcrete application process allowed for a way to quickly make the repairs without sacrificing the quality and safety of the finished rehabilitation (refer to Fig. 3).

The project consisted of the following primary activities: overhead beam strengthening, large spall repairs at interior beams and stairwells, and restoration of the exterior concrete façade.

The overhead portion consisted of a tight lattice work of reinforcement with two horizontal No. 4 (No. 13) reinforcing bars at the top and two No. 7 (No. 22) reinforcing bars at the bottom of the beams, No. 4 (No. 13) stirrups at 12 in. (305 mm) on center, No. 4 (No. 13) reinforcing bar dowels at 12 in. (305 mm) on center with a 90-degree hook, and 5/8 in. (16 mm) diameter threaded rod at 18 in. (457 mm) on center horizontal through existing beams. The gap between existing beams was filled, creating a section totaling 13 in. (330 mm) thick and 12 in. (305 mm) wide between beams. Cores taken from repaired sections proved there was a solid bond between the new shotcrete and the existing concrete of the structure (refer to Fig. 4).

The vertical spall repair that occurred in the stair wells and on the exterior façade varied from

Fig. 5: The exterior façade that has been chipped back to sound material and reinforcing bar installed

3 to 12 in. (178 to 305 mm) thick depending on the extent of the concrete that was chipped away and replaced. This is a six-story building plus a basement with floor-to-ceiling heights of 12 ft (3.6 m). For the stairwells, Nationwide Shotcrete, Inc., ran steel pipe and concrete hoses to each level and had scaffolding on each of the landings in the stairwell to allow for full access to all of the spalled areas. Due to the building size, the exterior façade repair required three aerial man lifts to provide access for the ACI Certified Shotcrete Nozzlemen and finishers (refer to Fig. 5 and 6).

Along with the benefits of speed and ease of overhead application, the use of shotcrete increased the sustainability of the project. The concrete mixture designs for the wet-mix shotcrete used a combination of silica fume and fly ash, which are recycled cementitious replacement materials. Shotcrete application also requires less formwork than the traditional cast-in-place concrete application, minimizing the total formwork material used for the project as well as reducing the time to place and strip the formwork. Reducing the amount of raw materials used and sourcing recycled materials for the mixture designs made the use of shotcrete over cast-in-place methods both an environmentally minded and cost-effective decision (refer to Fig. 7).

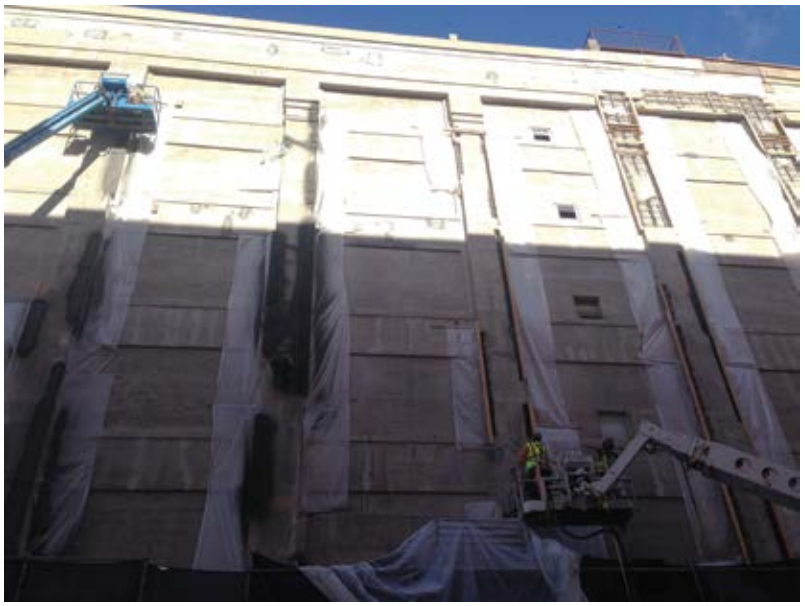

Fig. 6: The exterior façade during the shoot—several aerial man lifts were needed to properly reach the work spread over a wide area. This area was given a rubber float finish

Fig. 7: The exterior façade after shotcrete operations were completed

Paul Mendoza *is an Estimator/Project Manager at Nationwide Shotcrete, Inc. He has 7 years of experience in the shotcrete industry, working for shotcrete and concrete contractors in southern and northern California. He is working toward his BS in civil engineering and is certified as an Engineer-In-Training in California.*

Honorable Mention

Project Name
Alameda Square Building 3

Project Location
Los Angeles, CA

Shotcrete Contractor
Nationwide Shotcrete, Inc.*

Concrete Contractor
Wallock & Maggio, Inc.

General Contractor
Nemo Constructors, Inc.

Architect/Engineer
Farooq Maniar, Inc.,
Consulting Structural Engineers

Material Supplier/Manufacturer
National Ready Mixed Concrete Company

Project Owner
Atlas Capital Group, LLC

*Corporate Member of the
American Shotcrete Association