Rapid-Setting Cement Products Save Time

A tight schedule and a variety of project challenges were no match for contractor DF Perez, Anaheim, Calif., when renovation began on the California Institute of Technology's six-building South House complex. The project included concrete repair and replacement throughout the 86,000 square feet of interior and exterior space of six interconnected buildings. The goal was to maintain the architectural details of the original 1931 reinforced concrete construction while upgrading the buildings with 21st century technology. Furthermore, the entire project had to be completed in 14 months. In order to accomplish this feat, DF Perez used crews of 20 to 30 workers for 12- to 14-hour shifts, seven days a week for nearly a year to accomplish the required work on four dormitories, a cafeteria, and a recreation room. In addition, the contractor recommended some product substitutions that helped meet schedule demands. "We realized the use of high-performance rapidly setting cement products in place of conventional concrete products for all concrete and masonry restoration, including the fashioning of a wide range of cast-in-place or pre-cast concrete architectural details such as cornices, door surrounds, and stairway and bench caps, would enable us to proceed at a remarkably fast pace," says Michael Rodriguez, the estimator and project manager for DF Perez. "By using these rapid-setting products, which provide structural strength in one hour, we could save time without compromising the high standards of the specifications."

A variety of rapid-setting cement products manufactured by CTS Cement Manufacturing Corp., Cypress, Calif., that featured high strength and low shrinkage were used on the project. The use of these products also eliminated the need of a separate bonding agent and other work could continue hours after each pour. A variety of rapid-setting cement products manufactured by CTS Cement Manufacturing Corp., Cypress, Calif., that featured high strength and low shrinkage were used on the project. The use of these products also eliminated the need of a separate bonding agent and other work could continue hours after each pour. "The strength and workability of the rapid-setting products we used enabled us to match every detail we needed to replicate, both in texture and in color," Rodriguez says. This helped meet the project's requisite to remain true to the original architecture of the building. Restoration work covered every inch of student living space. Extensive infill and floor leveling of the kitchen/cafeteria floor was needed, as well as infill of bathroom floors and roof surfaces, crack repair to the buildings' walls, and restoration work on cement tiles. Balcony handrails and concrete balconies needed to be rebuilt and the basement needed modifications to accommodate more up-to-date air conditioning units. "Our crew patched badly weathered exposed concrete stairs with a mortar mix to which we had added an aggregate, resulting in a match," says Zac Keane, superintendent/foreman, DF Perez. "We also made new stairs where specified. Crews were able to match the original look with addition of dry powder pigments and specifically composed aggregate mixes." Work was completed on time and with the approval of the university's team of historical consultants who provided input throughout the project's duration. "It was a very difficult job, for sure," notes Rodriguez, "but everyone was happy with how it turned out."

High-performance rapid-setting cement helped replace a number of badly weathered concrete stairways. Photos: CTS Cement Manufacturing Corp.