2021 PCI DESIGN AWARDS

ALL–PRECAST CONCRETE SOLUTION AWARD AND MULTI-FAMILY BUILDING COWINNER

ESCONDIDO VILLAGE GRADUATE RESIDENCES

PALO ALTO, CALIFORNIA

Stanford University is a world-class institution that requires world-class housing for its students. But in 2017, the campus was facing a housing shortage, that strongly affected its 9000 graduate students. Only 55% of postgrads were able to secure on-campus housing, and more than 1000 were living in off-campus accommodations subsidized by the school. The high cost and rapidly rising rents in the area were creating financial stress for many students that the university wanted to solve.

The solution was to build four graduate housing buildings with 665 two-bedroom apartments, 517 premium studios, and 292 junior studio apartments. The structures would increase the university's on-campus graduate housing rate to approximately 75%, while also providing computer labs, activity spaces, and laundry facilities for students.

To meet the owner's goals, the designers had to align their vision with several aesthetic and structural requirements. The new buildings had to conform to campus standards for unit size, dimensions, and layout, and they had to mimic the traditional architecture of the campus. But they also had to use durable, cost-effective, and easy-to-maintain materials, and be built while school was in session, to accommodate the next round of graduate students arriving in 2020. The architect chose precast concrete to address all of these requirements and worked closely with the precast concrete producer to accelerate results.

"To complete the project on time, the entire design and construction team needed to begin detailed coordination efforts very early in the design process," says Ted Korth, design principal for KSH Architects. His team notes that many complex decisions had to be made early on—"most sooner than a conventional project."

For example, every penetration through the precast concrete floor system (over 14,000 in total) needed to be sized and located at a very early stage of design so the precast concrete producer could begin production. All window openings and sizes as well as detailed profiles for the exterior structural wall system also needed to be determined very early on. "All of these early decisions enabled manufacturing and erection of the building to proceed at a very rapid pace, with extremely high quality control," Korth says.

KEY PROJECT ATTRIBUTES

- More than 6700 windows were installed in the precast concrete plant.
- Choosing precast concrete helped designers cut six months from the schedule.
- Off-site fabrication resulted in 65,000 fewer worker-days on the jobsite, reducing dust, pollution, and safety hazards.

PROJECT AND PRECAST CONCRETE SCOPE

- Build four campus housing structures totaling 1,835,000 ft².
- The project used more than 14,000 precast concrete panels produced at three local plants.
- All four buildings were completed in 11 months.

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— Ted Korth, KSH Architects

PROJECT TEAM:

OWNER: Stanford University, Palo Alto, Calif.

PCI-CERTIFIED PRECAST CONCRETE PRODUCER AND PRECAST CONCRETE SPECIALTY ENGINEER: Clark Pacific, West Sacramento, Calif.

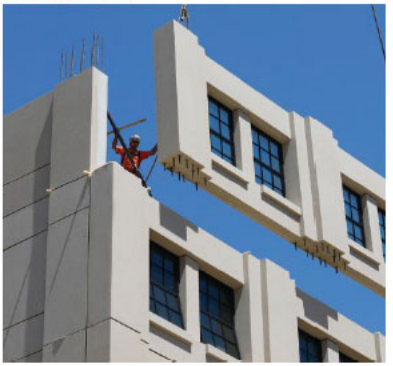
ARCHITECT: Korth Sunseri Hagey Architects (KSH), San Francisco, Calif.

ENGINEER OF RECORD: John A. Martin & Associates, Los Angeles, Calif.

GENERAL CONTRACTOR: Vance Brown, Palo Alto, Calif.

PROJECT SIZE: 1,835,000 ft²

Photos: Bernard Andre.



RICH AND VARIED DESIGN

The flexibility of precast concrete also allowed the designers to produce the desired textures, finishes, colors, and profiles to fit the campus design aesthetic. The precast concrete panels reference the original stone buildings on campus, with design details closely referencing the historical features of existing campus buildings.

By creating a staggered design that steps down from ten-story volumes to eight- and six-story sections, the mass of the project was noticeably reduced and the effect on neighboring areas was diminished. The first two floors of each building also feature a horizontal "combed" texture to add depth and character to the surface of the precast concrete panels.

Structurally, the building foundation system consists of large, continuous concrete spread footings under each frame. The roof of each residence building consists of a precast concrete slab, tapered insulation, and then a built-up roof system. The structural system is a special moment frame with exterior punched-window wall panels that are nearly 2 ft thick and provide a seismic solution.

"Utilizing the precast concrete system for both structure and architecture resulted in a rich and varied design," says Amanda Borden, associate principal and project architect for KSH.

Choosing precast concrete also delivered many environmental and community benefits. By fabricating all of the elements off-site, the precast concrete producer estimates they made 136,000 fewer road trips and had 65,000 fewer worker-days on the jobsite. That reduced the risk of worker injury, lessened the need for parking, and eliminated 65,000 days of dust, pollution, and other hazards on campus, says Bob Clark of Clark Pacific. "Because we were able to prefabricate everything off-site, at least 300 [fewer] employees had to come onto the site everyday during a busy campus season."

The precast concrete system ultimately provided the university with a highly durable long-term facility with reduced maintenance needs, and enhanced storm, fire, and seismic resistance. It also enabled designers to cut six months from the schedule, ensuring future graduate students will have a safe, comfortable place to live. ●