The goal of achieving sustainability was part of every decision made in the design and construction of Parking Structure 5 at California State University in Sacramento. Because the six-level structure with 1750 stalls sits at the very front of the campus, adjacent to its arboretum, the designers wanted to be sure that the structure would complement the natural setting, while also providing students and faculty with a durable, environmentally sound structure. The university also set a goal to achieve a Gold Parksmart rating, which is the highest rating offered by the Green Building Certification Inc. for the U.S. Green Building Council. The university “wanted it [the new project] to be the highest-performing, most sustainable parking structure west of the Mississippi,” says Farad Ibrahim, director of building systems innovation for the project’s contractor, Clark Pacific.

The use of precast concrete helped make that happen. From the use of repeatable custom formliners and locally produced concrete to the naturalistic aesthetics, this project is a celebration of environmental design and construction, Ibrahim says.

FOUR PROJECTS, ONE CAMPUS

At the time that Parking Structure 5 was constructed, it was one of four projects being built on campus, and some of the others were on the sites of existing parking lots, which increased the need for the new parking structure. For these reasons, construction speed and minimal disruption of campus activity were priorities. The off-site manufacturing of the precast concrete elements eliminated the need for laydown areas on-site. Using precast concrete also eliminated approximately 5700 worker-days from the project and shortened the schedule from an anticipated 18 to 24 months to 11 months. The precast concrete project “went much faster than conventional construction, significantly reducing the impact of construction on the campus,” Ibrahim says.

To minimize the project’s environmental footprint, the designers chose a precast concrete plant located just 27 miles from the jobsite. This plant derives more than 50% of its energy from its own colocated solar array, thereby reducing the environmental impact of manufacturing and transportation. “We eliminated waste and improved efficiency through the local manufacturing process, which also reduced cost and freed money for other enhancements,” Ibrahim says. These enhancements included 51 charging stations for electric cars, with infrastructure for 43 additional future spots, as well as adjacent integrated storage for 50 bicycles and 20 skateboards. The structure is also designed to receive a future photovoltaic canopy at the roof to offset energy usage.

The project used a high-performing precast concrete hybrid moment frame (PHMF) to provide enhanced resilience during a seismic event. The PHMF also allowed for an open structure that is shear wall–free, thereby greatly enhancing passive security. “This is especially important in a student campus setting,” Ibrahim notes.

“The construction impacts on our campus community were so minimal that I’ve had faculty remark that they were surprised to see that Parking Structure 5 construction had started and was already complete.”

— Tony Lucas, California State University

PARKING STRUCTURE 5—CALIFORNIA STATE UNIVERSITY SACRAMENTO

SACRAMENTO, CALIF.
The superstructure consists of prefabricated concrete panels featuring integral architectural finishes and attachments. The façade has a birch-like pattern and playful, fluttering metal leaves generate shadow patterns and the perception of movement, reflecting a tectonic expression of the natural beauty of the campus arboretum, Ibrahim says.

Overall, the campus and Clark Pacific are delighted with the outcome. The new parking structure “is an iconic, beautiful, and functional addition to the campus, and it blends seamlessly into our urban forest,” says Tony Lucas, senior director of university transportation and parking services. “The elegant design and on-budget delivery of Parking Structure 5 is a testament to this design-build team’s outstanding collaborative effort.”

Photos: Kyle Jeffers Photography.