

CASE STUDY

# CSU Sacramento Parking Structure 5

Sacramento, CA





# Setting New Standards for Parking Structure Delivery

Sacramento State's campus was in dire need of a solution. Located by the main entrance to Sacramento State, Parking Structure 5 (PS5) is designed to blend and complement the dense tree canopy of the nearby arboretum. Replacing an existing surface lot, the 1,750 stall, six-level parking structure serves a campus in dire need of parking and provides a structure exceeding the quality and efficiency of any previous parking facilities.

The use of the off-site manufacturing methods along with the Collaborative (Progressive) Design-Build approach made PS5 innovative, efficient and minimized overall campus disruption.

## Customer's Priorities and Goals

### Build it Quick

Clark Pacific was able to take advantage of working with precast systems as a means of providing a finished parking structure manufactured off-site and built on-site, in a short time. This meant nearly all structural components and façade elements were fabricated off-site in their entirety and then brought to the job site to be erected. Nearly 90% of fabrication was complete when the project gained approvals and permit to construct. By utilizing precast elements, the project was completed in just over 10 months. Additionally, transportation of prefabricated pieces was completed during off-hours ultimately limiting the overall amount of construction traffic on campus created by the project.

### Stay in Budget

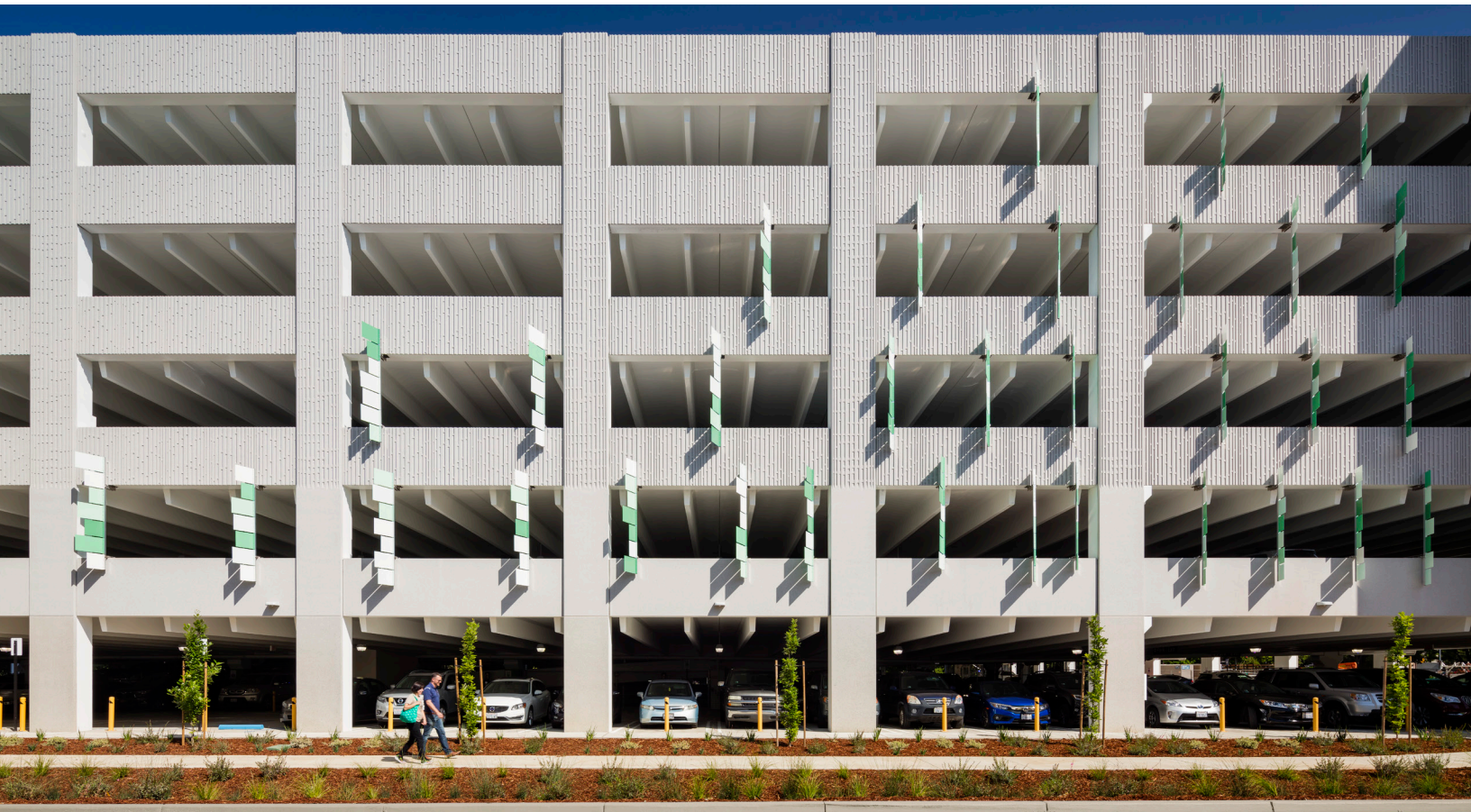
The campus had a set amount of funding for this project and had to meet deadlines for funding sources. The client utilized the Progressive Design-Build method to ensure the project would be completed effectively. Off-site manufacturing and early design-detailing integration provided for a much shorter construction schedule and therefore a more controlled budget. Continuous team communications prevented unforeseen issues and budget upsets throughout the entire project.

### Make it Look Good

First impressions are important, and this structure is a gateway to the campus. We worked closely with Dreyfuss and Blackford, the client and stakeholders to determine the best location for the function of the structure. This location also provided separate space for a Welcome Center and an outdoor public plaza. Playing off the dense tree canopy of the adjacent Arboretum, the custom precast concrete form liner resembles a tree bark pattern with an overlay of metal fin "leaves".

### Off-site Construction, Key to Success

For a campus already impacted by construction with three other large projects, the construction of PS5 progressed quickly and easily with very few challenges. The up-front design effort necessitated by the Progressive Design-Build delivery method and the prefabricated building systems approach, led to a smooth project and a beautiful addition to the campus.



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“The team successfully and safely delivered the project in alignment with the University’s program, within budget and utilizing the team’s prefabricated systems approach, significantly faster and with significantly less campus impact than competing conventional systems. The construction impacts to our campus community were so minimal that I’ve had faculty remark to me they were surprised to see PS5 construction had started and was already complete.”

– Tony Lucas, Senior Director University Transportation and Parking Services Sacramento State

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The façade of the structure was designed to mimic tree bark to match campus aesthetics.



Use of the Precast Hybrid Moment Frame gave the structure an open plan for safety.



Integration of a Wayfinder was added due to the project being built below budget.

A hallmark of prefabrication is that it inherently breaks down silos across design-build disciplines and brings team members together early on to focus on the design and constructibility. Prefabrication steered conversations with MEP and other subcontractors early, leading to a fully integrated team, and resulting in a more efficient design layout with innovations not realized in traditional construction methods.

Off-site manufacturing removed over 5,700 worker days from the campus jobsite to the manufacturing facility, reducing commuter impacts by over 10,000 car trips and parking and site impacts those workers would have had on site if the project had been delivered conventionally.

### Achieving Highest Level of Sustainability

The integrated parking technology, structure design, material innovations, placemaking signage with public art, and conservation programs implemented at PS5 will allow it to achieve a **Parksmart Gold certification by the Green Building Certification Institute**, making it the highest-performing, most-sustainable parking structure on campus and west of the Mississippi.

The structure provides 51 EV charging stations with infrastructure for 43 additional future spaces. The top deck is designed to have a future photovoltaic canopy to offset energy usage.

Electronic parking count systems let drivers know how many spaces are available and on which floor before they enter the structure, reducing the need to circle inside multiple times.

The structure also features a state-of-the-art seismic resistance system known as the Precast Hybrid Moment Frame (PHMF), designed to help it recover immediately after a large earthquake. It is designed to achieve a Platinum GOLD certification from the United States Resiliency Council, which rates structures for safety, damage and recovery time in a seismic event.

### Project Team

Owner: California State University, Sacramento

Architect: Dreyfuss + Blackford

General Contractor: Clark Pacific

Structural Engineer: Buehler & Buehler Structural Engineers





As a result of the project coming in under budget, we were able to include a variety of additional benefits for the client - many during construction - including:

- Revision of EV charging station vendors and related impacts
- Addition of a dry well
- Addition of a parking wayfinding system
- Parking management system upgraded to an ECO FlexTech Falcon Vision solution
- Integration with the pre-existing campus transportation mobile app
- Infrastructure for future solar expansion
- Integration with pre-existing campus pedestrian and bicycle routes
- Continual evaluation of campus circulation, allowing flexibility to alter adjacent campus roadways impacted by construction during the project, as well as temporary and permanent roadway signage and markings

## Awards

- 2019 Award of Excellence New Sustainable Parking and Transportation Facilities, International Parking & Mobility Institute
- 2019 Outstanding Environmental Leadership, Sacramento Environmental Commission Awards
- 2019 Sustainable Design, Precast Concrete Institute Design Award
- 2018 Structural Award, American Concrete Institute NC/WN Chapter
- 2018 Best Practice in Construction Delivery, California State University Facilities Management Awards
- 2018 Overall Best Practice, California State University Facilities Management Awards
- 2018 Innovative Sustainability Project of the Year, National Parking Institute



## Prefabricated Parking Structures



Coleman Highline Parking Structures — San Jose, CA



Apple Park Parking Structures — Cupertino, CA



Google Moffett Park Parking Structure — Sunnyvale, CA



GoPro Headquarters Parking Structure — San Mateo, CA

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