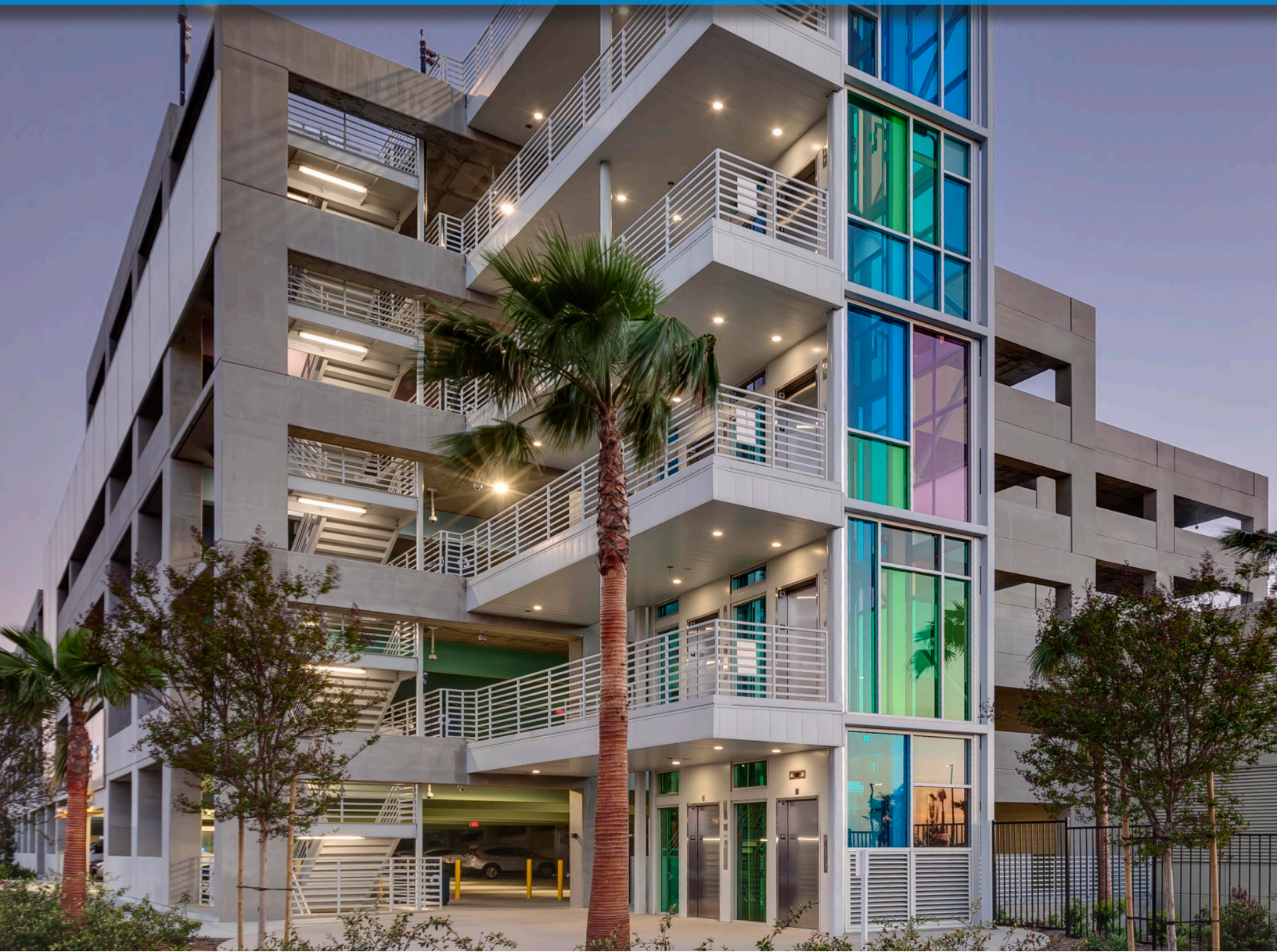


# PARKING



**miyamoto.** EARTHQUAKE +  
STRUCTURAL  
ENGINEERS



**SHARP**

**VISITOR PARKING**

Do Not Enter

Enter

FGC WEST STANDBY PIPE

# miyamoto.

save lives, impact economies

Miyamoto International is a global earthquake + structural engineering and project management company providing critical services that sustain industries and safeguard communities around the world.

We are experts in high-performance engineering that reduces lifecycle costs and produces a positive net impact on a structure's operation. We assess the performance of structures to identify specific vulnerabilities, and prioritize solutions that limit business interruption and reduce property damage.

Built on decades of earthquake and structural engineering experience in the field, our expertise supports how clients address the economic, political, social, sustainability and resiliency challenges in earthquake risk reduction and post-disaster recovery and reconstruction.

Miyamoto offices are strategically located worldwide in earthquake-hazard regions to positively impact economies and save lives.

Sacramento  
San Francisco  
San Jose  
Los Angeles  
Orange County  
San Diego  
Reno  
Washington, D.C.  
Mexico  
Costa Rica  
Colombia  
Haiti  
Liberia  
Italy  
Turkey  
India  
Nepal  
Japan  
New Zealand

**make the world a better, safer place.**



The C3 parking structure is a new 9-level, 1,010-stall high-rise parking structure designed by Miyamoto engineers to serve a new 7-story commercial office building. Due to a very tight site, the structure had to share foundations with an existing 8-level parking structure constructed in the mid-1980s. Though the original structure was designed for a future expansion, changes in building

codes and ownership of the different properties demanded creative foundation solutions from Miyamoto. The structure is post-tensioned slabs and long-span Cunningham beams. The office building connects to the parking structure at two levels with 130-foot-span pedestrian bridges that also are seismically supported in the parking structure.

## C3 Office Parking Structure

**LOCATION:**  
Culver City, CA

**YEAR:**  
2017

**CLIENT:**  
KPRS

**CONSTRUCTION COST:**  
\$14.7 Million

**SCALE:**  
360,000 SF  
1010 stalls  
9 stories  
2 bridges

**AWARDS:**  
2017 OUTSTANDING ACHIEVEMENT AND EXCELLENCE IN CONCRETE CONSTRUCTION, SOUTHERN CALIFORNIA CHAPTER OF AMERICAN CONCRETE INSTITUTE



Miyamoto provided design services for a new two-story police station with holding cells, separate parking garage and a vehicle maintenance and fueling facility. Confronted with a tight budget in a very unstable construction environment, Miyamoto engineers produced a highly

economical structure by making best use of the available design methods and materials. This included the use of precast concrete for the parking garage and a highly efficient design for the police station in order to reduce steel tonnage.

## Los Angeles Police Department Rampart Station and Parking Structure

LEED Gold®

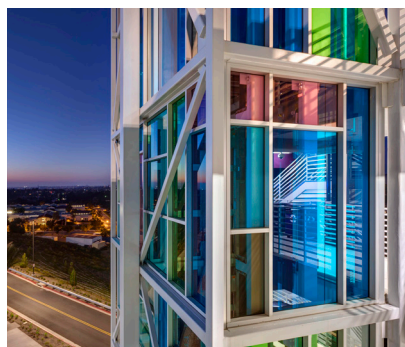
**LOCATION:**  
Los Angeles, CA

**YEAR:**  
2008

**CLIENT:**  
Perkins and Will

**CONSTRUCTION COST:**  
\$30.2 Million

**SCALE:**  
57,000 SF Facility / 85,600 SF Garage  
231 Parking Spaces



## Sharp Chula Vista Medical Center Parking Structure

**LOCATION:**  
Chula Vista, CA

**YEAR:**  
2015

**CLIENT:**  
Barnhart-Reese Construction  
Parking Design Associates

**CONSTRUCTION COST:**  
\$21 Million

**SCALE:**  
7 Stories  
718 Stalls

The seven-level, 718-stall, post-tensioned concrete parking structure at Sharp Chula Vista Medical Center features a 105-foot-tall, glass and structural steel elevator tower that serves as an eye-catching focal point at the entry into the hospital campus. The parking structure also includes segregated doctor's parking on the

lower level with separate entry/exit accommodations from those of the public. Included in this project scope was the design and construction of a new two-story, structural-steel framed cooling tower to serve the addition of Sharp's future Ocean View Patient Tower, set to open in 2019.



When LAWA initiated a program to rehabilitate its outdated elevators at LAX, Miyamoto's vital role in the expansion and restoration included the modernization of seven parking garages, seven parking structure elevator enclosures and seven exit stairwells and pedestrian finishes to fit the parking structure's aesthetics. The

scope of work included completing two new elevators in the terminal areas, new shaft extensions for the elevators, new structural steel framing to provide support for the new facade at the stairs and elevator shafts and converting the existing helipad roof to parking.

## LAX Parking Garage and Terminal Elevator Replacements

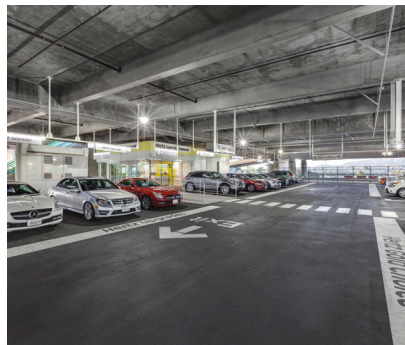
**LOCATION:**  
Los Angeles, CA

**YEAR:**  
2017

**CLIENT:**  
Base Architecture

**CONSTRUCTION COST:**  
\$40 Million

**SCALE:**  
7 Parking Garages  
7 Elevator Towers  
7 Exit Stairwells



Miyamoto International was the Structural Engineer for the design phase of Bob Hope Airport's Regional Intermodal Transportation Center (RITC), the first transportation hub in Southern California to serve trains, buses, cars and bikes. The three-story concrete and corrugated steel structure is home to a consolidated rental car facility, emergency response center and terminal services for airport shuttles and transit buses. The center includes more than 1,000 parking spaces and 11 car rental companies, four times the airport's former volume.

The 520,000-SF facility was built to withstand an 8.0-magnitude earthquake, serving as an emergency nerve center for rescue agencies from across the nation. Our "beyond code" design featured triple-pendulum bearing isolators to diffuse the rolling motion and absorb seismic energy.

RITC is topped by a red steel roof with solar panels. For egress and pedestrian safety, an elevated covered walkway shuttles passengers along a moving sidewalk to the central terminal area.

## Bob Hope Airport, Regional Intermodal Transportation Center

**LOCATION:**  
Burbank, CA

**YEAR:**  
2015

**CLIENT:**  
Burbank-Glendale-Pasadena Airport Authority (Owner)  
PGAL (Prime)

**CONSTRUCTION COST:**  
\$112 Million

**SCALE:**  
520,000 SF

### AWARDS

2014 ENGINEERING NEWS RECORD (ENR), CALIFORNIA BEST PROJECT AWARDS: AVIATION





## Madera County Government Center and Parking Structure

**LOCATION:**  
Madera, CA

**YEAR:**  
2007

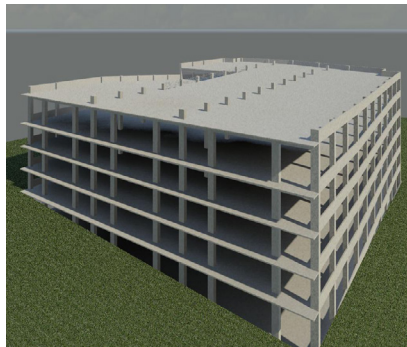
**CLIENT:**  
Dreyfuss & Blackford

**CONSTRUCTION COST:**  
\$33 Million

**SCALE:**  
130,300 SF, 4 Stories  
400 Car Garage

Miyamoto provided structural design services to this 4-story, 130,300-SF governmental office and courthouse building and parking structure for 400 cars. This work consolidated previously scattered county offices and court spaces, which reduced inefficiencies and improved customer service. The structure is framed with steel supported by composite concrete above a metal deck that is supported

by long-span, lightweight open-web joists that offer column spacing at 50 feet on center for maximum flexibility and minimal floor vibration. Wide flange columns on shallow spread footings and special moment frames reduce seismic and wind loads. Helical mini-piles are used to resist uplift forces. The resulting building was light weight and very cost effective.



The 6-level 905 stall parking structure with 5 levels above grade and 1 level below grade, exists to support the Qualcomm BA site buildings. Seismically separated from one tower, exterior façade enhancements have

been created to blend in with the architecture of the campus. The result is a highly functional space that meets today's needs with the ability to change with future demands.

## Qualcomm BA Parking Structure

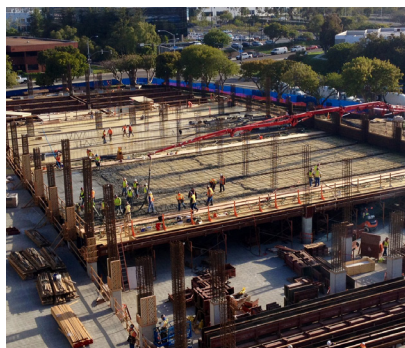
**LOCATION:**  
San Diego, CA

**YEAR:**  
2014

**CLIENT:**  
Parking Design Associates

**CONSTRUCTION COST:**  
\$8 Million

**SCALE:**  
905 stall



## Qualcomm Pacific Center Parking Structure

**LOCATION:**  
San Diego, CA

**YEAR:**  
2013

**CLIENT:**  
Parking Design Associates

**CONSTRUCTION COST:**  
\$14 Million  
\$8,600/Stall

**SCALE:**  
36,437 Square Meters  
392,201 Square Feet

This six-level, post-tensioned concrete parking structure accommodating 1,516 parking stalls was originally designed as a five-level, 1,224 car structure. The structural challenge was to maximize the number of stalls by adding an additional level. By maintaining the original concrete moment frame layout, the original stall layout was maintained for all levels. Also, early in the design process, Miyamoto explored a value-engineering solution for the foundation system. Due to the amount of artificial fill material over the existing subsurface canyon and

magnitude of the foundation loads, a deep foundation system (drilled piers) was proposed in the geotechnical report. However, an existing canyon drain was a challenge to drill near, as the exact location was unknown. We recommended an alternate system and rammed aggregate pier (RAP), which is a ground improvement technique, to increase the capacity of the soil. By using the alternative foundation system, construction costs were reduced by over \$200,000, the construction schedule was maintained and the risk of damaging the existing canyon drain was reduced.



California State University, Sacramento is primarily a commuter school. With most students living off campus, structured parking meets demands by going vertical, freeing surface lots for academic buildings. This was the first parking structure at CSUS with

a 6-level structure. It is constructed using mildly reinforced and post-tensioned cast-in-place concrete. Special concrete shear wall systems were used in both the transverse and longitudinal directions.

## California State University, Sacramento, Parking Structure I

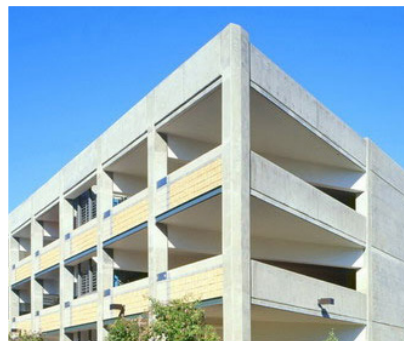
**LOCATION:**  
Sacramento, CA

**YEAR:**  
1992

**CLIENT:**  
International Parking Design

**SCALE:**  
504,000-SF

**DELIVERY METHOD:**  
Design-Build



California State University, Sacramento is primarily a commuter school. With most students living off campus, structured parking meets demands by going vertical, freeing surface lots for academic buildings. Parking Structure II is a 300,335-SF structure with 1,001 stalls. This four-level structure has a post-tension concrete floor system supported by cast-in-place concrete

columns. The seismic force-resisting system consists of 20" thick concrete shear walls. High performance earthquake engineering techniques were used to optimize the performance based design of the structure and foundation system, resulting in a savings of nearly 2000 cubic yards of concrete and \$750,000 in construction costs.

## California State University, Sacramento, Parking Structure II

**LOCATION:**  
Sacramento, CA

**YEAR:**  
2001

**CLIENT:**  
International Parking Design

**SCALE**  
300,035 SF

Four-Level

1,001 Stalls

**DELIVERY METHOD:**  
Design-Build



## California State University, Sacramento, Parking Structure III

**LOCATION:**  
Sacramento, CA

**YEAR:**  
2007

**CLIENT:**  
International Parking Design  
McCarthy

**CONSTRUCTION COST:**  
\$25 Million

**SCALE:**  
1,000,000 SF

Six-Level

3,100 Stalls

**DELIVERY METHOD:**  
Design-Build

California State University, Sacramento is primarily a commuter school. With most students living off campus, structured parking meets demands by going vertical, freeing surface lots for academic buildings. The largest parking structure in the CSU system is designed as two independent structures separated by a seismic gap and a light well that runs nearly the full width of the structure. With 3,000 stalls and one million square feet, this six-level structure was constructed using mildly reinforced and post-

tensioned cast-in-place concrete. A special moment-resisting frame (SMRF) system was used in both the transverse and longitudinal directions, which will withstand seismic events and provide safety to students and staff. High performance engineering techniques were used to 1) eliminate grade beams between piles, 2) eliminate the need for shear walls, and 3) limit the seismic gap for the full height of the structure to six inches. The structure was built on a tight budget and aggressive schedule.



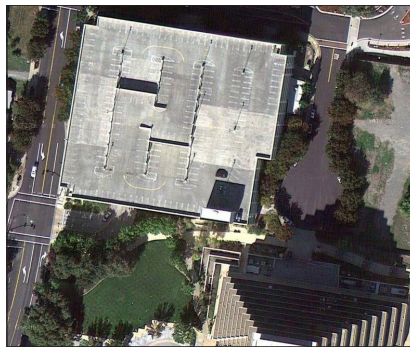
## Civic Center Plaza Parking Structure

**LOCATION:**  
Sacramento, CA

**CLIENT:**  
International Parking Design

This parking structure was built to accommodate all of the government employees working in adjacent buildings. The eight-story structure

features post-tensioned construction with cast-in-place concrete columns and pre-cast cladding.



Miyamoto performed a parking garage peer review for the six story parking garage. This 11-story, pyramid-shaped office building became one of the first buildings in the United States to use seismic dampers. The structural system uses steel special moment resisting frames with fluid

viscous dampers (FVD) to reduce displacements and accelerations to preserve the life of the building. The Ziggurat combines state-of-the-art engineering technology and a unique design resulted in an award-winning structure that is an icon of the Sacramento skyline.

## The Ziggurat California Department of General Services Headquarters

Parking Lot Peer Review

**LOCATION:**  
West Sacramento, CA

**YEAR:**  
1998

**CLIENT:**  
EM Kado and Associates

**CONSTRUCTION COST:**  
\$60 Million

**SCALE:**  
450,000 SF

**AWARDS:**

1999 STRUCTURAL ENGINEERING  
EXCELLENCE AWARD, SEAOC

1998 OUTSTANDING CIVIL ACHIEVEMENT  
AWARD IN BUILDING DESIGN,  
AMERICAN SOCIETY OF CIVIL ENGINEERS





## Riverside Community College District, Coil School of Arts Parking Structure

**LOCATION:**  
Riverside, CA

**YEAR:**  
2015

**CLIENT:**  
Riverside Community College District (RCCD)

**CONSTRUCTION COST:**  
\$5.8 Million

**SCALE:**  
83,368 SF  
224 Stalls

The 4-level post-tensioned concrete parking structure, accommodating a total of 224 parking stalls, has been designed to accommodate the additional students, staff and community for the new Performing Arts facility. Early in the design process, Miyamoto explored a value-engineering solution for the foundation system. Due to the amount of artificial fill material a deep

foundation system (drilled piers) was proposed in the geotechnical report. We recommended an alternate system, rammed aggregate pier (RAP), which is a ground improvement technique to increase the capacity of the soil. By using the alternative foundation system, construction costs and schedule were reduced compared to the drilled pier system.



This project included the installation of a new steel-framed parking structure within an existing tilt-up warehouse. The existing facility was comprised of 4 existing tilt-up concrete structures. The approximately 150,000 square foot parking structure is three stories tall and provides 366 stalls. The seismic force resisting system consists of buckling-restrained braced frames (BRBFs), a revolutionary but not yet codified structural system at the time of construction. At the existing two story

retail building, new transfer girders were designed above the existing roof and detailed to efficiently suspend four existing column/beam connections to create a large open space for a new basketball court at the second floor. Miyamoto designed the superstructure to accommodate the larger foundation settlements associated with shallow foundations, to preserve the economy of the foundation system over a deeper pile foundation system initially recommended by the City.

## Nordhoff Plaza Parking Structure

**LOCATION:**  
Northridge, CA

**YEAR:**  
2009

**CLIENT TEAM:**  
KTTY, AMPE, Inc., DRC, Bergman, Red Mountain Retail Group

**CONSTRUCTION COST:**  
\$10 Million

**SCALE:**  
13,935 Square Meters  
150,000 Square Feet



The three-story Valley Bureau Headquarters and 230-car parking structure effectively combines training, administrative and parking facilities in a single, efficient structure on a highly constrained former industrial site. The building is constructed cast-in-place concrete, with exposed concrete shear walls. Pile foundations are used, with locations carefully selected to minimize interference with abandoned

foundations from the site's previous occupant. The result is a highly functional space that meets today's needs with the ability to change with future demands. This facility is one of many new police stations funded by Proposition Q, all of which faced compressed schedules and tight budgets to maximize the return on the public investment.

## LAPD Valley Bureau Headquarters & Traffic Division

**LOCATION:**  
Van Nuys, CA

**YEAR:**  
2008

**CLIENT:**  
RNL Design  
Los Angeles Police Department

**CONSTRUCTION COST:**  
\$19 Million

**SCALE:**  
34,000 SF



This eight-story, 334,000 SF parking structure provides an additional 1,107 public parking spaces to midtown Sacramento's business community. In addition, retail spaces were designed on the south side of the structure. The project's structural design was complicated by less than optimal soil conditions that required utilization

of a mat foundation to successfully complete the project. The structural system utilized long span post-tensioned beams and one way post-tensioned concrete slabs and ductile moment frame lateral load resisting elements in both directions.

## Sutter Community Parking Structure

**LOCATION:**  
Sacramento, CA

**YEAR:**  
2008

**CLIENT:**  
McCarthy Builders

**CONSTRUCTION COST:**  
\$23.6 Million

**SCALE:**  
334,000 SF



Irwindale



Monrovia



Arcadia

Miyamoto International worked closely with team members led by the IBI Group to develop conceptual designs and construction budgets for four unique parking structures serving adjacent Metro Gold Line transit stations. The Advanced Conceptual Engineering (ACE) package was then issued to prospective Design/Builders who completed the final design and construction of the facilities. Periodic meetings were held with LA Metro

Line Authority and our team to review the overall design and validate the construction budget. Efficient and productive communication was paramount, ensuring continuity of design between the structural, electrical and mechanical teams. Stall counts in each facility varied per location according to position along the Metro Gold Line route from Pasadena extending eastward to Azusa.

## Metro Gold Line Parking Facilities

**LOCATION:**  
San Gabriel Valley, CA

**YEAR:**  
2015

**CLIENT:**  
Metro Gold Line Authority

**STALL COUNTS:**  
Monrovia - 365  
Irwindale - 350  
Arcadia - 300  
Azusa - 200



This project consists of two phases. The first phase is a 7-story mixed-use development, including 274 residential and live-work units with five stories of Type III wood-framed construction over a two-level parking structure plus basement of Type I podium level concrete construction with an additional story of below grade parking.

The total building area is approximately 490,755 SF, with 162,641 SF of parking providing 484 parking spaces, 57,094 SF of office space and 74,701 SF of ground floor commercial space. The second phase is a 12-story hotel with an estimated construction of \$30 million. The design is estimated to start in the first quarter of 2018.

## 6041 Variel Avenue

**LOCATION:**  
Woodland Hills, CA

**YEAR:**  
2019

**CLIENT:**  
6041 Variel, LLC

**OWNER:**  
BCEGI (Beijing Construction Investment USA)

**CONSTRUCTION COST:**  
\$105 Million

**SCALE:**  
785,191 SF

## PARKING EXPERIENCE

**555 Capital Parking Garage, 8 stories**  
Sacramento, CA

**Academy of Our Lady of Peace,  
Parking Structure, 2 stories, 104 stalls**  
San Diego, CA

**Burbank Airport Regional  
Intermodal Transit Center**  
Burbank, CA

**Business Plaza Parking Structure,  
5,000 stalls**  
Sacramento, CA

**C3 Office Parking Structure, 1,010  
stalls, 9 stories**  
Culver City, CA

**Cabrillo College Parking Structure,  
500 stalls**  
Aptos, CA

**California Plaza Parking Structure**  
Los Angeles, CA

**California State University,  
Sacramento, Parking Structure I**  
Sacramento, CA

**California State University,  
Sacramento, Parking Structure II**  
Sacramento, CA

**California State University,  
Sacramento, Parking Structure III,  
3,000 stalls**  
Sacramento, CA

**City of Sonora Parking Structure, 3  
stories**  
Sonora, CA

**Civic Center Plaza Parking Structure  
8 stories**  
Sacramento, CA

**Days Inn Parking Structure, 2 stories**  
Inglewood, CA

**Department of Water and Power  
Parking Structure**  
Valley, CA

**Foothill Gold Line Intermodal Parking  
Structure Bridging Documents, 4  
structures, 1,215 stalls total**  
Foothill, CA

**Famco Retail and Garage  
Development Parking Structure**  
Los Angeles, CA

**Gateway Plaza Stage I and II Parking  
Structure**  
Los Angeles, CA

**Grand Avenue Medical Building  
Parking Structure**  
Los Angeles, CA

**Hall of Justice Parking Structure,  
Design-Build, 4 levels above grade  
and 4 levels subterranean, 1,000  
stalls\***  
Los Angeles, CA

**Harmony Elementary School Parking  
Structure, 65 stalls**  
Los Angeles, CA

**Jackson Rancheria Casino Parking  
Structure**  
Jackson, CA

**John Thomas Dye School, Phase II  
Parking Garage\***  
Los Angeles, CA

**Kern County Administration Building  
Parking Structure, 5 stories, 800  
stalls\***  
Bakersfield, CA

**L Street Imaging Center Parking  
Structure, 2 stories**  
Sacramento, CA

**LAPD, Harbor Division Station  
Parking Garage**  
Los Angeles, CA

**LAPD Parking Garage, Construction  
Reviews\***  
Los Angeles, CA

**LAPD, Rampart Division Station  
Parking Garage**  
Los Angeles, CA

**LAPD, Rampart Station and Parking  
Structure, 270 stalls**  
Los Angeles, CA

**LAPD, Valley Bureau Headquarters  
and Traffic Division**  
Van Nuys, CA

**LAPD, Valley Division Parking  
Structure**  
Van Nuys, CA

**LASC NEQ Parking Structure\***  
Los Angeles, CA



LAX Parking Garage and Terminal  
Elevator Replacements  
Los Angeles, CA



Qualcomm Pacific Center Parking  
Structure  
San Diego, CA



California State University, Sacramento,  
Parking Structure II  
Sacramento, CA

**LAX Parking Garage and Terminal Elevator Replacements**  
Los Angeles, CA

**Los Angeles Academy Middle School Parking Structure, 90 stalls**  
Los Angeles, CA

**Los Angeles Convention Center Addition and Parking Structure, 4,000 stalls**  
Los Angeles, CA

**Los Angeles Southwest College NE Quadrant Parking Structure DSA Certification, 4 stories, 380 stalls**  
Los Angeles, CA

**Los Angeles Southwest College Parking Structure DSA Structural Plan Review**  
Los Angeles, CA

**Madera County Government Center and Parking Structure**  
Madera, CA

**Mercy General Hospital Parking Structure Investigation, 5 stories**  
Sacramento, CA

**The Meridian, 1400 Ocean Boulevard, 2 stories, 100 stalls**  
Long Beach, CA

**Metro Gold Line Parking Facility, 300 stalls**  
Arcadia, CA

**Metro Gold Line Parking Facility, 200 stalls**  
Azusa, CA

**Metro Gold Line Parking Facility, 350 stalls**  
Irwindale, CA

**Metro Gold Line Parking Facility, 365 stalls**  
Monrovia, CA

**Midtown Crossing, 3 stories\***  
Los Angeles, CA\*

**Nordhoff Plaza Parking Structure, 3 stories, 366 stalls**  
Northridge, CA

**Northwest Airlines Federal Credit Union and Parking Structure**  
Apple Valley, MN\*

**Old Tavern Parking Structure, 3 stories**  
Sacramento, CA

**The Piazza at Temple City Parking Structure, 4 stories, 617 stalls**  
Temple City, CA

**Plaza San Clemente, 2 stories, 1,200 stalls \***  
San Clemente, CA

**Qualcomm Building AY/AZ Parking Structure, 1,516 stalls**  
San Diego, CA

**Qualcomm Building BA Parking Structure, 904 stalls**  
San Diego, CA

**Qualcomm Pacific Center Parking Structure, 6 stories, 1,516 stalls**  
San Diego, CA

**RTD Gateway Center, Rapid Transit District, 450 stalls**  
Los Angeles, CA

**Radiological Associates of Sacramento L Street Imaging Parking Structure and Medical Office Building**  
Sacramento, CA

**Ronald Reagan Federal Building and Courthouse Parking Structure**  
Santa Ana, CA

**Riverside Community College Coil School of Arts Parking Structure, 4 stories, 224 stalls**  
Riverside, CA

**Sacramento City-County Parking Structure, Lot G, 5 stories**  
Sacramento, CA

**San Fernando Road Consolidated Facility Parking Structure**  
Los Angeles, CA

**San Marcos Medical Building Parking Structure**  
San Marcos, CA

**Sharp Chula Vista Parking Structure, 7 stories, 718 stalls**  
Chula Vista, CA

**Spectrum MOB Parking Structure, 107 stalls**  
Irvine, CA

**Stockton and T Streets PS, 5 stories, 326 stalls**  
Stockton, CA

**Sutter Community Parking Structure, 8 stories, 1,107 stalls**  
Sacramento, CA

**Sutter Health PAMF Fremont Ambulatory Surgery Center and Parking Structure, 4 levels, 217 stalls**  
Fremont, CA



Ronald Reagan Federal Building and Courthouse Parking Structure  
Santa Ana, CA



Sharp Chula Vista Parking Structure  
Chula Vista, CA



**Sutter Parking Garage**  
Sacramento, CA

**St. Regis Monarch Beach Resort  
Parking Structure, 7 stories, 867  
stalls\***  
Dana Point, CA

**Tulsa West Civic Parking Structure, 6  
stories, 1,198 stalls\***  
Tulsa, OK

**Tuolumne County Parking Structure  
for Rose Court, 2 stories**  
Sonora, CA

**USC University Gateway Parking  
Garage, 8 stories, 1,200 stalls\***  
Los Angeles, CA

**The Ziggurat, California Department  
of General Services Headquarters  
Parking Lot Peer Review, 6 stories**  
West Sacramento, CA

*\* Staff experience*



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