

## BAY AREA HOSPITALS

### CONTACT

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## CPMC CATHEDRAL HILL

Location: San Francisco, California  
Client: Sutter Health CPMC  
Architect: SmithGroupJJR  
Partner: Degenkolb, HerreroBoldt, Pankow Builders , Boulder Associates, Miyamoto/Mar  
Services: Geotechnical, Earthquake/Seismic, Environmental

### OVERVIEW

Once constructed, the \$2.5 billion Sutter Health California Pacific Medical Center (CPMC) Van Ness and Geary project will be a flagship medical center for San Francisco. The campus will include an acute care hospital, a medical office building (MOB) across the street, and an underground pedestrian tunnel to connect the two structures. A two- to three-level 'moat' will surround the basement's isolated portion to structurally separate the hospital building from the surrounding ground. Key issues in the site's development are maintaining stability and limiting excavation-induced deformations. Our services include geologic hazard evaluation, geotechnical investigation, earthquake engineering, Phase I and II Environmental Site Assessments, Environmental Contingency Plan, Soil Management Plan, and construction observation.

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Credit: Agnieszka Jakubowicz

## ZUCKERBERG SAN FRANCISCO GENERAL HOSPITAL AND TRAUMA CENTER

Location: San Francisco, California  
Client: City and County of San Francisco, BCM-SAR Divisions  
Architect: Fong and Chan  
Services: Geotechnical, Earthquake/Seismic

### OVERVIEW

The Zuckerberg San Francisco General Hospital and Trauma Center is the only Level One trauma center serving 1.5 million people in the region. It is also the only hospital in San Francisco built with a base-isolated foundation, the latest technology for protecting buildings during seismic activity. The 10-story public hospital (8 stories above and 2 stories below ground) was constructed in an open space area next to the administrative, outpatient, and acute-care hospital buildings. Both hospitals are now connected via a pedestrian bridge and underground utility tunnel. Langan provided geotechnical and earthquake/seismic consulting services for the project.

### AWARDS

2016 Engineering News Record California Best Projects, Healthcare Best Project

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## ST. LUKE'S HOSPITAL

Location: San Francisco, California  
Client: St. Luke's  
Partner: SWA Group  
Services: Geotechnical, Environmental

### OVERVIEW

Expected to achieve LEED certification, the 215,000-SF acute healthcare facility in the Mission District will champion sustainability and efficient patient treatment. The modernized campus will also be able to withstand and remain in operation after a strong earthquake. Langan performed seismic studies, a geologic hazard evaluation, a geotechnical investigation, and an environmental consultation for this five-story replacement hospital.

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## MERCED REPLACEMENT HOSPITAL

Location: Merced, California  
Client: Dignity Health  
Partner: KPFF Consulting Engineers  
Services: Geotechnical, Geologic Hazards

### OVERVIEW

Langan performed the geologic hazard evaluation and geotechnical investigation for the Merced Replacement Hospital. The development was constructed within a vacant, 35-acre site, and includes three phases with three hospital buildings, three medical office buildings, a parking garage, a central plant, and a utility conduit.

### AWARDS

2011 Lean Construction Institute  
2009 American Institute of Architects, Design Award

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## VENTURA COUNTY HOSPITAL REPLACEMENT WING

Location: Ventura, CA  
Client: Clark Construction Group, LLC  
Partner: KPFF  
Services: Geotechnical

### OVERVIEW

The Hospital Replacement Wing (HRW) project at Ventura County Medical Center (VCMC) consists of a 2-3 story Acute Care Facility, including a basement. The VCMC currently consists of five interconnected hospital buildings: a medical laboratory/cafeteria building, two mental health buildings, a medical office building, and an emergency generator building. The footprint of the proposed HRW is 93,000 SF and is primarily occupied by a parking lot.

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## CHINESE HOSPITAL

Location: San Francisco, California  
Client: Chinese Hospital  
Architect: MEI, Jacobs Engineering Group  
Services: Geotechnical, Earthquake/Seismic

### OVERVIEW

Langan performed a geologic and seismic evaluation and geotechnical investigation for a new acute care hospital building and for the Chinese Hospital replacement at 835-845 Jackson Street.

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## HIGHLAND HOSPITAL

Location: Oakland, California  
Client: Highland Hospital  
Architect: SmithGroupJJR, Ratcliff, Shah Kawasaki Architects  
Partner: Clark Construction, Vanir Construction, Degenkolb Engineers  
Services: Geotechnical, Earthquake/Seismic

### OVERVIEW

Highland Hospital/Alameda County Medical Center is a \$668 million makeover of an aging public hospital. The project, owned by the County of Alameda, includes replacement facilities to be completed in three phases over seven years, making it the largest health care investment in the County's history. Langan provided geotechnical engineering services during design and construction of Highland Hospital. We also provided a geologic hazards report for the project that included an evaluation of landslides, liquefaction, and seismic ground shaking hazards. Our firm has provided geotechnical engineering services for this project since 2007. In 2012, the project received the Design Build Institute of America (DBIA) Merit Award for 'Projects in Progress.'

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## VA PALO ALTO HEALTHCARE SYSTEM

Location: Palo Alto, California  
Client: SmithgroupJJR  
Services: Geotechnical, Environmental

### OVERVIEW

Langan provided geotechnical and environmental engineering services for new medical facilities for the VAPAHCS, including a three-story Polytrauma/Blind Rehabilitation Center and five-story Ambulatory Care Center. Additional facilities included a new research building, a radiology addition to the existing hospital building, a recreational therapy building, two parking structures, several utilities buildings, a water supply tank, and new utilities and roadways.

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## SAKAKAWEA MEDICAL CENTER

Location: Hazen, North Dakota  
Client: The Neenan Company  
Services: Site/Civil

### OVERVIEW

A new Sakakawea Medical Center is being constructed on the same campus behind the current facility. Once complete, the old facility will be torn down and turned into a parking lot. The new facility will enable the Sakakawea Medical Center to serve as both a critical access hospital and a primary care medical center to meet the emergency needs of its rural community.

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## KAISER MISSION BAY MEDICAL OFFICES

Location: San Francisco, California  
Client: Whiting-Turner  
Architect: Studios Architecture  
Services: Geotechnical, Environmental

### OVERVIEW

The site for the 9-story, 220,000 SF Kaiser Permanente medical office building in Mission Bay is in a liquefaction hazard zone so our geotechnical investigation was performed in accordance with the recommended methodology for evaluating liquefaction potential. We developed a significant indicator pile and load test program to evaluate constructability and capacity of the drilled displacement piles, a relatively new pile type in Mission Bay at the start of construction. Langan worked closely with the team to develop criteria for the installation of the foundations. Our environmental team developed a preliminary and final design documents for a methane mitigation system (MMS) for the building and provided construction administrations services.

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## MILLS-PENINSULA MEDICAL CENTER

Location: Burlingame, California  
Client: Sutter Health  
Architect: Anshen + Allen (now Stantec)  
Services: Earthquake/Seismic, Geotechnical

### OVERVIEW

Sutter Health's Mills Peninsula Medical Center is a 6-story acute care hospital with 311 beds. The hospital required seismic design review by the State of California Office of Statewide Healthcare Planning and Development (OSHPD). This is the first hospital in the Northern California with a base-isolation structural system. Connected to the hospital is a 5-story medical office building and a 4-level parking garage. Langan performed a geologic hazard evaluation and geotechnical investigation. We also developed seismic design criteria and time histories for use in the structural design. Sutter Health most recently obtained Langan's services for a helipad.

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## UCSF PARNASSUS MOFFITT HOSPITAL

- Location: San Francisco, California  
Client: University of California at San Francisco (UCSF)  
Partner: Degenkolb Engineers  
Services: Geotechnical, Earthquake/Seismic

### OVERVIEW

Langan provided engineering services for the seismic evaluation of the existing Moffitt Hospital and Medical Sciences Building at the UCSF Parnassus Campus. The Moffitt Hospital is a 15-story concrete structure over one basement level. The northern wing of the Medical Sciences Building is a 13-story structure over one basement level, while the southern wing is a 14-story structure at grade. We reviewed subsurface information at the site and its vicinity, developed site-specific response spectra, and provided geotechnical foundation criteria for existing walls and footings. After performing a downhole seismic velocity survey and drilling a 100-foot deep boring, we recommended vertical and rotational stiffness parameters of existing foundations and response spectra for the appropriate soil profile type. Our team performed probabilistic seismic hazard analyses and deterministic analyses to develop response spectra for two levels of shaking for each building.

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## ALTA BATES MERRITT PAVILION

Location: Burlingame, California  
Client: Sutter Health  
Architect: Devenney Group Limited, EDAW Landscape  
Partner: DPR Construction , Degenkolb Engineers  
Services: Environmental

### OVERVIEW

The Alta Bates Summit Medical Center Merritt Pavilion is a 230,000 SF facility with a 1,067-space parking garage. The 11-story medical center is 184 feet above ground with two below-ground levels. Langan provided a Phase I Environmental Site Assessment for this project.

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