

**RUDOLPH AND SLETTEN**

GENERAL AND ENGINEERING CONTRACTOR'S JOURNAL

# HOOKED ON CONSTRUCTION

INCORPORATED 1960

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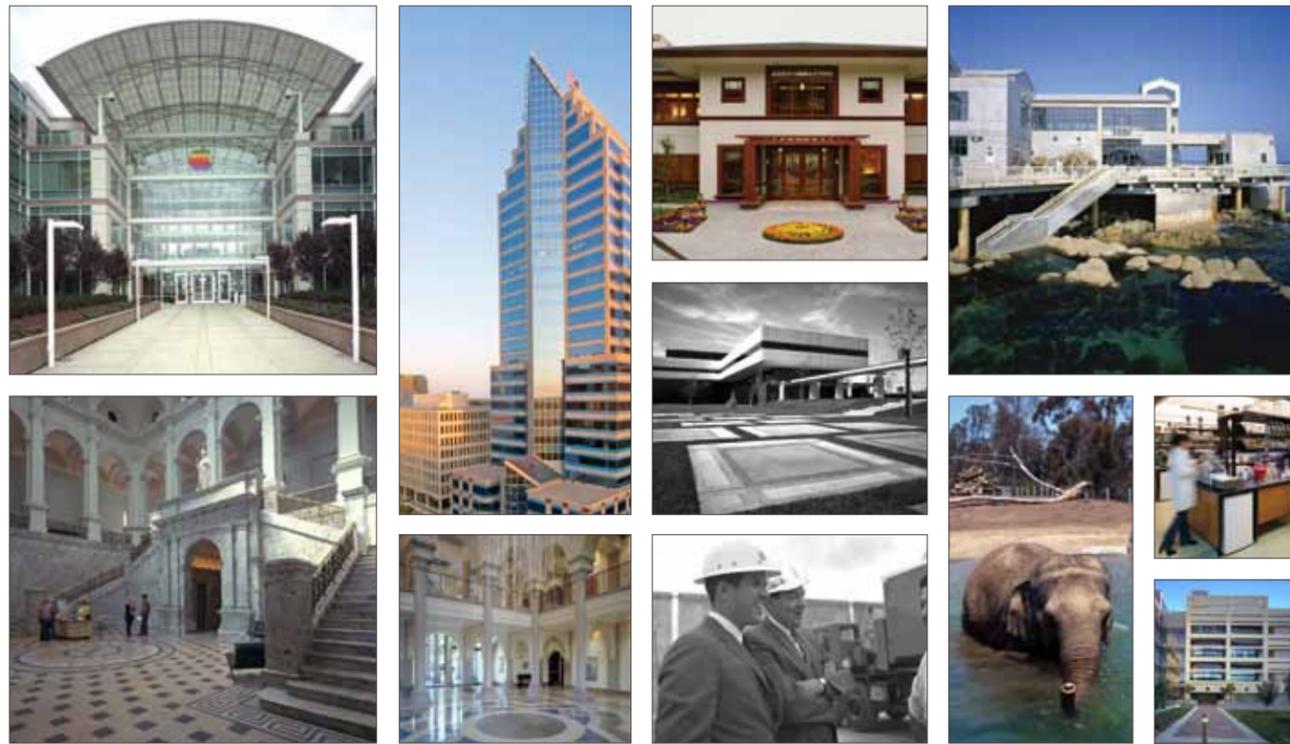
GENERAL AND ENGINEERING CONTRACTORS

## Joining Old with New: The Crocker Art Museum Expansion

Integrated Project Delivery:  
UCSF Cardiovascular Research Center  
SOLYNDRA: Record Breaking  
11-month Clean Energy Construction

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*Apple Computers Research and Development Campus (1984); Stanford Cantor Center for the Visual Arts (1998); Bank of the West Tower (2009); University of San Diego Shiley Center for Science and Technology (2003); Lucasfilms Big Rock Ranch (2002); Memorex Research Facility (1969); Onslow "Rudy" Rudolph and Ken Sletten, the company's founders; Monterey Bay Aquarium (1984); San Diego Zoo's Elephant Odyssey (2009); Gladstone Mission Bay Laboratory Building (2004); Stanford Beckman Center for Molecular and Genetic Medicine (1989)*



# BUILDING 50 YEARS

## of trust, innovation and technology

From humble beginnings, Rudolph and Sletten has grown into a leader in construction. From biotech and technology to hospitality and healthcare, Rudolph and Sletten has helped shape the West, one building at a time. Building on California's strong innovative spirit, Rudolph and Sletten uses technology, collaboration and sustainable construction to build trust and dependable results in all that they do.

To put us to work on your next construction project, call Dianna Wright (650) 216-3600.



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GENERAL AND ENGINEERING CONTRACTOR'S JOURNAL

# HOOKED

ON CONSTRUCTION

## COVER STORY

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LEED-targeted Laboratory for UC Berkeley

photo by Ed Asmus

## Tradeline's Lean Facility Lifecycle 2011 Conference

Rudolph and Sletten has been chosen to present the topic of Lean Integrated Project Delivery in Diverse Contracting Strategies. The presentation will demonstrate that Integrated Project Delivery (IPD) and Lean construction can be employed within different contract and procurement structures, within the public or private sector, and does not rely on specialized contract agreements.

By examining four projects in different stages of construction, Rudolph and Sletten will discuss how Lean methods provide exceptional results, improve timelines, control budget reliability and reduce waste.

Conference attendees will learn how the use of Last Planner™, BIM, co-located teams, bridging to design-build, smart use of technology, and offsite fabrication can be implemented in any contract environment to improve budget, schedule, quality and reliability.

The projects that will be discussed include:

- University of California San Francisco, Cardiovascular Research Building
- The National Oceanic Atmospheric Administration, Southwest Fisheries Research Building
- Solyndra, Fab 2 Manufacturing Facility
- Kaiser Permanente, Redwood City Hospital.

The conference will be held March 21 - 22, 2011 at the San Diego Hilton Mission Bay in San Diego, California.

## Constructing a World for Graceful Dolphins, Magnificent Pilot Whales and a Rainbow of Exotic Birds

In SeaWorld's new dolphin show, "Blue Horizons" a young girl's vivid imagination inspires a whimsical, yet dramatic, atmosphere with an immense rising sun, hundreds of iridescent bubbles, and an elaborate, 40-foot-high framework which envelops the pool and balances divers and aerialists as they plunge from bungees and soar on "cloud swings."

Rudolph and Sletten completely transformed the stadium including an entirely new set including trusses, diving boards and bungee swings for the aerialists and divers; a new sound system; high-tech water features and an additional 700 seats.



photo provided by SeaWorld

## Two Rudolph and Sletten Projects Win Awards: Best of 2010 Healthcare Award of Merit and Two Building of America Winners

### El Camino Hospital Wins the California Construction Award of Merit in Healthcare and the Building of America Award for Northern California

The new 488,000-square-foot hospital followed a number of guiding principles throughout the designing, planning and construction to maintain focus on building a community hospital for the future. The building accommodates 223 licensed beds and an emergency room/department holding an additional 36 beds. The building also includes a 10-bed observation unit, a conference center, 16 operating/interventional treatment rooms, a multi-track Emergency Department and flexible nursing modules with 28 critical care and 180 acuity adaptable beds.



photo by Michael O'Callahan



photo by RMA Architectural Photography, Inc.

### USD Student Life Pavilion Wins the Building of America Award for Southern California

The 55,000-square-foot Student Life Pavilion serves as the hub for student life activities with a full-service dining area and greenhouse market as well as additional office space for student affairs, campus publications and campus clubs and organizations.

"The Student Life Pavilion blends the best thinking in healthy student dining, sustainability, technology and student/faculty engagement in one incredible facility," said Carmen Vazquez, Vice President of Student Affairs.

# SOLYNDRA: Dialogue and collaboration completes clean energy manufacturing facility in a record 11 months.

Rudolph and Sletten completes the Solyndra Fab 2 Manufacturing Facility in Fremont, California at a speed befitting the high-tech clean energy industry. Construction on the 600,000 square foot building began in September 2009; the structure was ready for equipment installation 10 months later. The unprecedented pace was accomplished through a Lean integrated project delivery in collaboration with the design program manager, CH2MHill, and the key trade partners.

The design and construction team implemented Lean integrated principles and methods that adapted and evolved to meet expectations. Solyndra, Rudolph and Sletten, CH2MHill and the trade partners formed a collaborative and agile team motivated to accomplish Solyndra's business goals.

Their Lean approach employed five key components:

- Target value design and schedule
- Integration between design and field production team for foundation systems
- Bridging from 60% MEP design to design-build and team's onsite co-location.
- Large assembly offsite fabrication and robust production design.
- Last Planner™ reverse phase scheduling

## Target Value Design

Early in the design phase, Rudolph and Sletten and CH2MHill worked together to validate design concepts in relationship to cost. A feedback loop of design and cost studies evolved to provide real-time budget estimates. The project was delivered within the original target value budget and without compromise to the manufacturing production requirements.

## Foundation Systems Design and Field Production Team

A mat foundation design, up to 7 feet in thickness, consisting of 70,000 cubic yards of concrete and 8,000 tons of rebar was completed in 4 months. CH2MHill, Degenkolb structural engineers and Rudolph and Sletten maintained a constant dialogue to develop the details and installation sequences for the site preparation, rebar and concrete placement. Meeting daily to resolve questions and make key decisions, the design and construction team formulated efficient information process flows eliminating waste in the submittal and shop drawing reviews.

## Bridging from 60% MEP Design and Team's On Site Location

CH2MHill visually described the complex mechanical, electrical, and plumbing (MEP) infrastructure systems by using Building Information Modeling (BIM). The MEP trade partners, Kinetics, CMI and Rosendin mobilized in October 2009 to complete the design and construction BIM. The team began installing piping and ductwork in February 2010.

At the start of the transition from the 60% design bridging documents to the trade partners' design-build effort, Rudolph and Sletten conducted a full-day offsite session of dialogue with the entire construction team members to create a structure for effective collaboration.

"Participants learned quickly that removing information silos and barriers, solving problems rapidly, and eliminating waste by engaging in face-to-face daily dialogue and decision-making were essential to success," said Fettig. "Having everyone onsite streamlined the problem resolution and decision-making process required to meet the tight schedule."

## Large Assembly Offsite Fabrication and Robust Production Design

BIM allowed for significant offsite fabrication of large assemblies. Several hundred feet of piping rack sections (40 feet in length) were fabricated offsite, shipped to the jobsite, lifted into place and connected. The coordination of this just-in-time supply chain was made possible by using BIM and establishing a schedule flow that put piping rack sections into place on the day they were delivered.

## Last Planner™ Reverse Phase Scheduling

The team held reverse phase scheduling sessions, aided by the BIM visual workplace, to reach consensus on schedule logic and milestone dates. The "Last Planners" conducted detailed conversations that clarified the relationships between the trade partners' workflows.

"This collective decision making process, given the dynamic pace and complexity of the project, developed commitments that were critical to achieve the on time project completion," stated Fettig. "The participant's learned quickly that this agile network of commitments, fostered through the reverse phase scheduling sessions, opened the flow of communication vital to the project's success."

**"The project team's ability to complete the design, logistics and schedule planning, and mobilizing trade partners to finish the \$270 million construction project in a period of less than 11 months is a remarkable achievement," said Kevin Fettig, Vice President at Rudolph and Sletten. "At the height of construction we were accomplishing more than \$1 million of construction per day."**

Solyndra Fab 2 | Owner: Solyndra | Architect: CH2MHill | Size: 600,000 sq ft | Completion date: 2010



**"The new facility is fantastic, and stands prominently as a flagship clean-tech project for the Bay Area, the state and even the country as was highlighted by the mid-project visit by President Obama. By meeting our deadline, the team has allowed us to meet strong customer demand, lower manufacturing costs, and provide thousands of local jobs."**

— Ben Bierman,  
Executive Vice President,  
Operations and Engineering

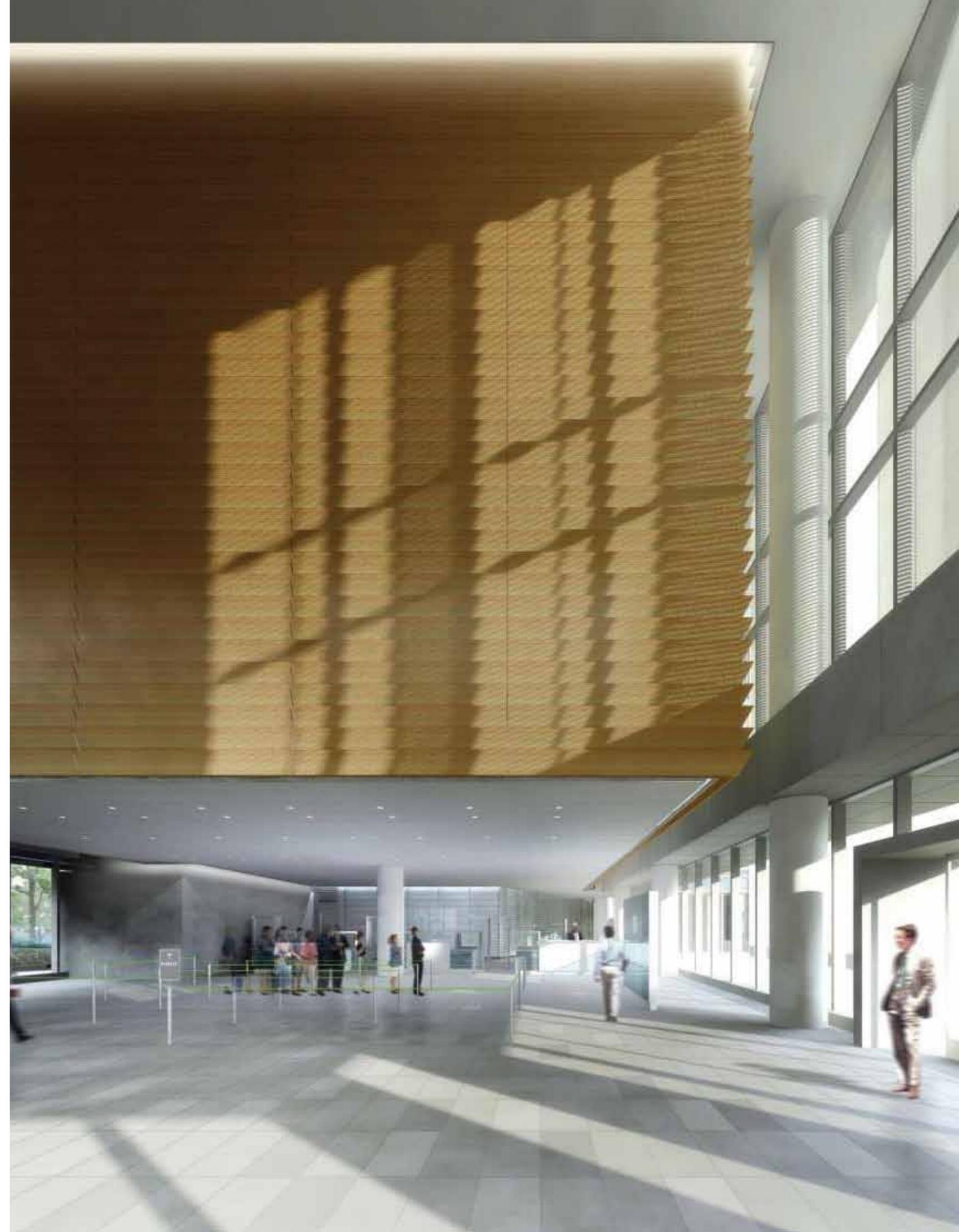


# THE CHANGING LANDSCAPE of Justice Construction

Courthouses have historically been a key component of urban centers often occupying a prominent location in the town square. Today, justice centers continue to be an integral part of American cities while undergoing a transformation. The changing economic and environmental landscape is altering how courthouses are built.



renderings by Hewitt Garrison Architectural Photography





## San Bernardino Courthouse

In addition to the traditional life-safety and health concerns common to all buildings, courthouse construction must address aesthetics, security, regulations, barrier-free access, mechanical/electrical systems, automation, acoustics, interior finishes, and sustainability. Today more than ever you need a contractor that understands the complexities in building such an important part of a city's center. Rudolph and Sletten's expertise in complex construction has found a new practice in the construction of courthouses in California. In the past year, the company has been awarded two major courthouse projects—the San Bernardino Courthouse and the San Diego Central Courthouse.

The San Bernardino Courthouse will consolidate services from seven facilities—criminal, traffic, family law, juvenile, appeals and appellate, and probate divisions of the Superior Court in addition to providing spaces for court administration, self-help, jury services, sheriff's operations, and in-custody holding.

The 378,000-square-foot courthouse will occupy a 7.1-acre site as part of a larger downtown campus of city, county, state, and privately-owned buildings. The new courthouse will consist of 35 courtrooms, 2 hearing rooms, 36 Judges' chambers; office work areas and support spaces, as well as 33,000 square feet of public space and common areas.

The 12-story tower, designed by Skidmore Owings & Merrill LLP, will house the courtrooms and judicial offices. This tower will express the stature of the Court and serve as a landmark for the city. Within the tower, each floor will contain four courtrooms, with public hallways and waiting areas occurring behind a glassy façade on the north. This transparent façade will enable those using the building to view the city and surrounding mountains, while providing visibility into the functioning of the Court to the public outside the building.



The \$272 million project was awarded through the Administrative Office of the Courts' (AOC) Construction Manager at Risk (CMR) evaluation process that evaluates candidate in four categories: 1. Financial strength, safety record, and claims avoidance, 2. Demonstrated experience of the firm, 3. Demonstrated experience and training of project personnel, and 4. Project plan. The evaluation results in a score that is then divided into the total bid price to generate the cost per unit of quality.

## San Diego Central Courthouse

Rudolph and Sletten has been selected by the California Administrative Office of the Courts to manage the construction of the planned \$633.9 million, 704,000-square-foot San Diego Central Courthouse. The courthouse will be the largest project funded through Senate Bill 1407, which finances new and renovated court facilities using court user fees rather than the state's general fund.

Scheduled to open in 2016, the new 71-courtroom, high-rise building will provide the local community with a larger more modern facility offering greater security. The current courthouse, 48 years old, poses security and ongoing maintenance issues.

The building will be clad in richly textured limestone, recalling the historic courthouse and reflect the dignity of the Superior Court. The building will also feature:

- Improved courtroom configuration—35 courtrooms and 2 hearing rooms. Most courtrooms will accommodate juries, and all have access to holding facilities for in-custody detainees.
- Designed for future expansion—the building will accommodate the construction of 4 full-sized courtrooms in lieu of the smaller courtrooms and hearing rooms, as caseload needs change.
- Sustainable design—With a minimum target of LEED® Silver certification, the courthouse will seek to establish a sustainable model for the city. The design carefully considers orientation, shading, material selection, and landscaping so that the building will thrive within its desert climate.

**“Among the selection criteria that led us to choose Rudolph and Sletten was the experience of their project principals as well as their local subcontractor outreach plans. The project promises to generate many new local construction jobs.”**

**— Clifford Ham  
Principal Architect for the Judicial Council of California,  
Administrative Office of the Courts**

The courthouse will fill a city block bordered by B and C Streets to the north and south, and Union and State Streets to the east and west. The planned 22-story building, approximately 375-foot tall courthouse, designed by Skidmore Owings & Merrill LLP, will include a pedestrian bridge to the adjacent Hall of Justice for staff and public circulation, as well as a tunnel to the nearby County central jail, providing secure transport of in custody defendants and additional security for visitors to the new courthouse.

The new building will replace three current courthouses: County Courthouse, Family Court and Madge Bradley Court, and will be an important part of a modernization of San Diego's downtown government district.

## Rudolph and Sletten Begins Work on Kaiser Permanente San Leandro Medical Center

Rudolph and Sletten is constructing a new, 264-bed, 434,000-square-foot hospital for Kaiser Permanente in San Leandro, California. This "second generation" template hospital, which reflects Kaiser Permanente's program to establish standardized, yet customizable, state-of-the-art models for design and construction of its hospitals, includes the latest technology for patient care and support.

The new acute-care medical center will include inpatient nursing functions, medical imaging/radiology, clinical labs and a blood bank, 10 operating rooms and recovery spaces, pharmacies, an emergency department, cafeteria and other building support departments. A 30,000-square-foot central utility plant will contain all of the necessary major mechanical and electrical equipment necessary to support the medical center. The campus will also provide surface parking for up to 2,100 vehicles. A number of "green" building features will also be implemented throughout the Medical Center based on the standards of the Green Guide for Healthcare.

"Rudolph and Sletten is a crucial partner on the San Leandro Medical Center project," said Mike Gipson, Rudolph and Sletten Project Executive. "Having completed two hospitals in the vicinity for Kaiser Permanente in the last several years, we are familiar with their processes and have adapted well to their innovative project delivery systems."

Based on the building models provided by the Architect and Structural Engineer, 3D Building Information Modeling (BIM) work is being created to reduce the potential for conflicts between building systems. This conflict reduction is especially important for hospital buildings due to the precise inspection standards for installed systems. Rudolph and Sletten and the Design/Assist and Design/Build Subcontractors are working together to identify, locate and sequence elements of the building and its utility supply systems. This process takes into account installation sequencing, manufacturer's installation requirements, construction tolerances, and code clearance tolerances. Rudolph and Sletten is also modeling several of the building elements for integration into the model.

**Kaiser Permanente San Leandro Medical Center is the largest construction project in the city's history.**

**After construction, Kaiser Permanente will be the largest employer in San Leandro.**



Rudolph and Sletten is directly managing the clash detection process using NavisWorks software, which integrates all the Architect, Structural Engineer, Design Assist and Design Build information into one comprehensive model. This Quality Control process provides three key benefits:

- 1) Ensures that field installation issues are reduced
- 2) Checks compatibility of architectural, structural and MEP design systems
- 3) Achieves cost efficiency with a higher rate of accuracy on offsite prefabricated utility systems

The result of this effort is a building design that has conflicts resolved and integrated into the construction documents, reducing the number of RFI's and OSHPD Change Orders during construction. Additionally, this model will become a working document for the Facility Engineer after the work is complete.

Rudolph and Sletten's construction scope includes the abatement of hazardous materials and the deconstruction and recycling of the previous distribution center at the construction site. Over 97% of the materials were recycled on the project, including wood pulp, structural steel, reinforcing steel, concrete and asphalt paving. All of the concrete and asphalt paving materials were crushed and stockpiled for re-use on site as fill and base rock material.

Rudolph and Sletten recently completed another template hospital for Kaiser Permanente in Vacaville, California.

Owner: Kaiser Foundation Health Plan, Inc.  
 Architect: Ellerbe Becket, Inc. (An AECOM Company) and Hawley Peterson Synder  
 Size: 740,000 sq ft  
 Completion date: 2014

# A WORK OF ART

Classic and modern blend in construction expansion

Crocker Art Museum Expansion  
Owner: The Crocker Art Museum  
Architect: Gwathmey Siegel & Associates Architects  
Size: 125,000 sq ft  
Completion date: 2010



## The Top-Ranked Builder of Cultural Facilities in California Builds the 125,000-Square-Foot Expansion of the Crocker Art Museum.

The expansion, known as The Teel Family Pavilion, more than triples the museum's current size and enhances the Museum's role as a cultural resource for California and its many visitors. The expansion quadruples the amount of gallery space, increasing the presence of the permanent collection, which has grown by more than 4,000 works over the past decade.

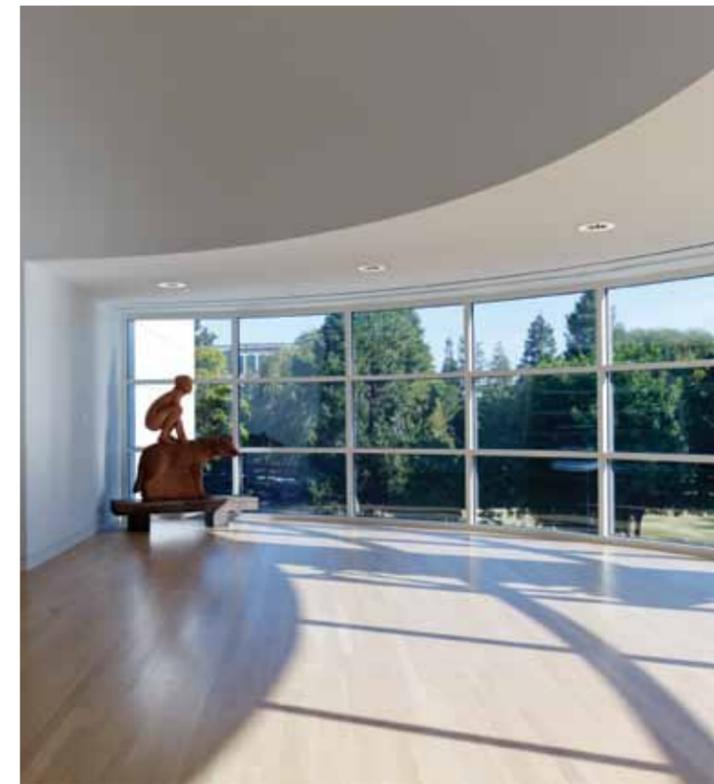
The expansion provides dedicated programming space, including an art education center and auditorium; onsite collections care including art storage and a conservation lab; 260-seat auditorium; a cafe; and an additional 7,000-square-foot courtyard. And, after 125 years, the Crocker Art Museum finally has a loading dock and a large-capacity freight elevator for easier art and exhibit handling.

The designers were conscious of the new building's historic neighbor. The new building echoes the original Crocker's Victorian Italianate lines in subtle ways, including overall height; both have a balcony, and both building facades share a similar color palette and the use of zinc. Approximately 4,000 aluminum panels and 4,500 zinc panels form the exterior of the new Crocker. The zinc panels will patina over time, changing color as they age. Saw-toothed skylights along the roofline offer a dramatic deviation from rectangular and gently rounded forms. Inside, carefully placed windows frame views of the original facility across from the new courtyard, most notably, a 22-foot tall by 105-foot long curtainwall that perfectly frames the historic gallery's impressive western façade.



“The museum is vital to the region’s cultural and economic development, and the new Crocker is an important icon for Sacramento’s ongoing emergence as a cultural destination and a world-class city.” — Kevin Johnson, Sacramento Mayor

While the new building looks sleek and spacious as viewed from the original gallery windows, inside its skeletal frame, consisting of 1,400 tons of steel and 10,000 cubic yards of concrete, is where the building's true massiveness is revealed. The first-floor reception area seats 1,000. The built-in auditorium seats another 260. A new 7,000-square-foot courtyard flanks the reception space and connects to the recently renovated existing 14,500-square-foot courtyard, allowing for large-scale indoor/outdoor events.



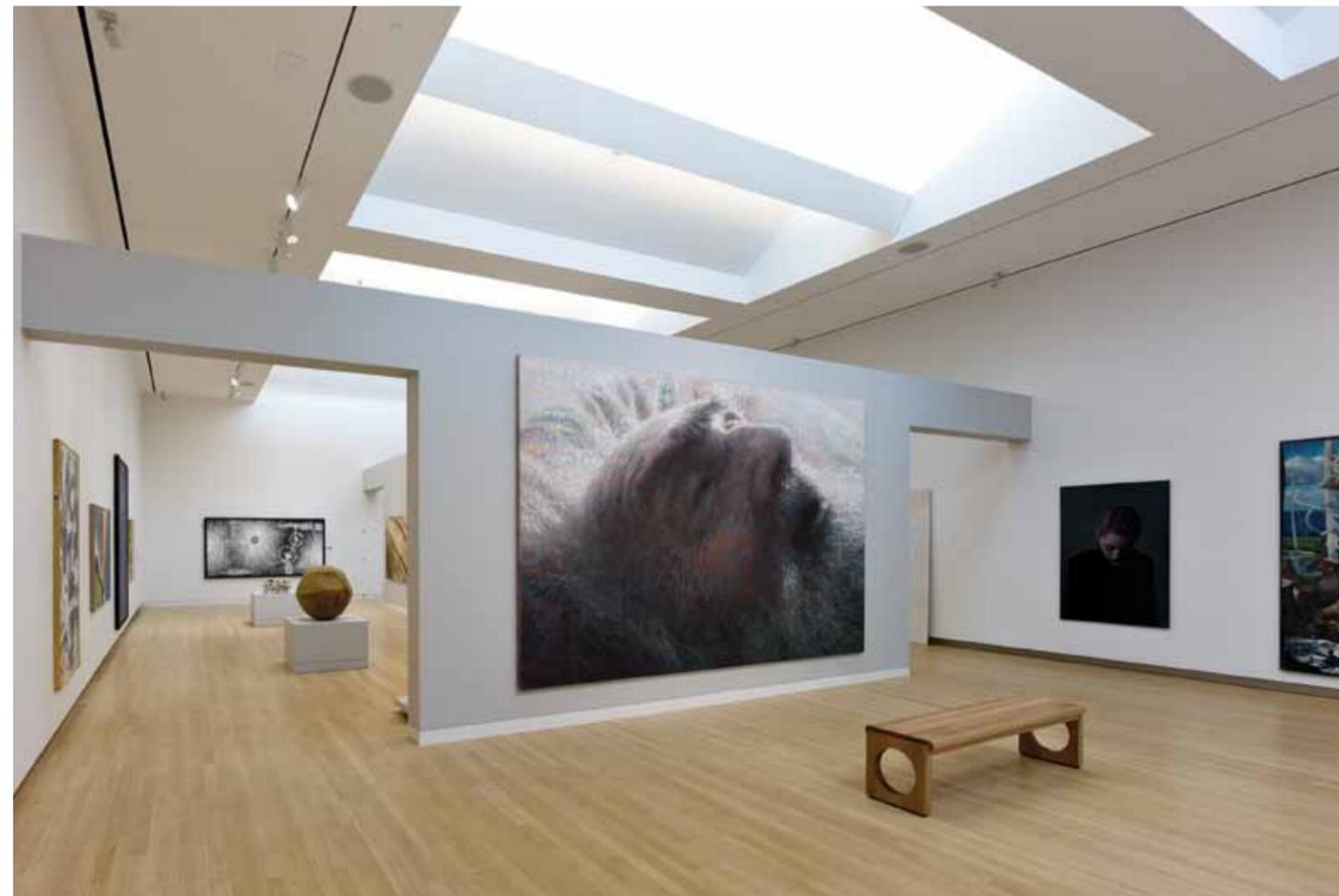
“Museums are some of the most challenging construction projects given the complexity of systems required to effectively run them and the high degree of finish required. Temperature and humidity control systems, security systems, life safety and fire safety systems are all critical construction elements that require additional knowledge and superior execution to maintain the safety of the artwork as well as the comfort of staff and patrons.”

—John Home, Senior Project Manager for Rudolph and Sletten

The Rudolph and Sletten construction team created several full-scale mock-ups of the new building to test materials for water tightness, constructibility and quality control. Double walls lined with vapor barriers were required to accommodate the precise temperature and humidity controls. The temperature in art spaces cannot change more than a few degrees; humidity cannot vary more than 5% from an optimal level of 50%. The building underwent a rigorous commissioning process to confirm the building controls could hold the carefully controlled climate at steady state for a full 30 days.

“The City of Sacramento has put all building systems through its paces very thoroughly to ensure the Crocker's art collection is in a highly-functioning, safe and secure building. The report back is that they are very satisfied with the performance,” notes Home. “A great level of care has been exercised by the entire construction team. To walk through the building and feel it's even temperature and comfort, to observe that everything is running smoothly, is rewarding.”

Another feature unique to museums is the structure's ability to sustain tremendous weight loads. Each floor must be analyzed for maximum loading requirements. At times the structure may need to support a heavy sculpture in a gallery space, in addition to a large number of moving patrons. The end structural result is a very stout and dense steel frame capable of supporting all of the various static and dynamic loads. But there are challenges posed by this thick skeletal mass. The museum has high ceilings, designed to create dramatic and voluminous spaces. With the majority of building services like electrical, plumbing



and ductwork running above finished ceilings, it becomes difficult to find room for it all among oversized steel beams and girders. Rudolph and Sletten and its team of specialists spent nearly nine months coordinating every construction detail of the design by creating a three-dimensional computer model to ensure all the different systems would integrate – and be buildable. The end result was a highly efficient installation where pipes and ductwork weave like an unending umbilical cord through and around large structural steel members – all out of sight.

“You’d never believe how many miles of densely packed services reside above these ceilings. It’s an incredibly organized jumble. People would be amazed to see how it fits together in such a tight space,” suggests Home.

Rudolph and Sletten also preformed some restoration work in the historic gallery and mansion buildings. Several ADA upgrades throughout the facility have occurred in bathrooms, stairwells and public corridors. Additionally, new flooring, refurbished wood trim, and final work in the educational center are taking place. The entire facility—expansion and existing connected together—will be one new and improved museum with much to offer.

“It’s a perfect marriage between the old and the new. Walking across the bridge between the new modern building and the 1872 gallery building feels seamless, yet there’s an excitement you get as the experience on both sides is so different. We’re extremely proud and honored to have been a part of this landmark project and look forward to public seeing what the new Crocker has to offer our community. It’s simply breathtaking.”

— John Home, Senior Project Manager for Rudolph and Sletten

# Design-Build Healthcare

## New Sharp Rees-Stealy Downtown Wellness Center



rendering by AVR Studio

Rudolph and Sletten and AVR Studio has been selected for the design and construction of Sharp Rees-Stealy Medical Group’s new Wellness Center in Downtown San Diego, California.

The new 66,000-square-foot medical office building will offer services including Family Medicine, Internal Medicine, Urgent Care, Occupational Medicine, Radiology, Physical Therapy and specialty practices such as Allergy, Dermatology, Endocrinology, Neurology, Optometry, Podiatry and Rheumatology. The new three-story building will contain 100 exam rooms, 36 physician offices and 20 administration offices as well as specialty and support rooms.

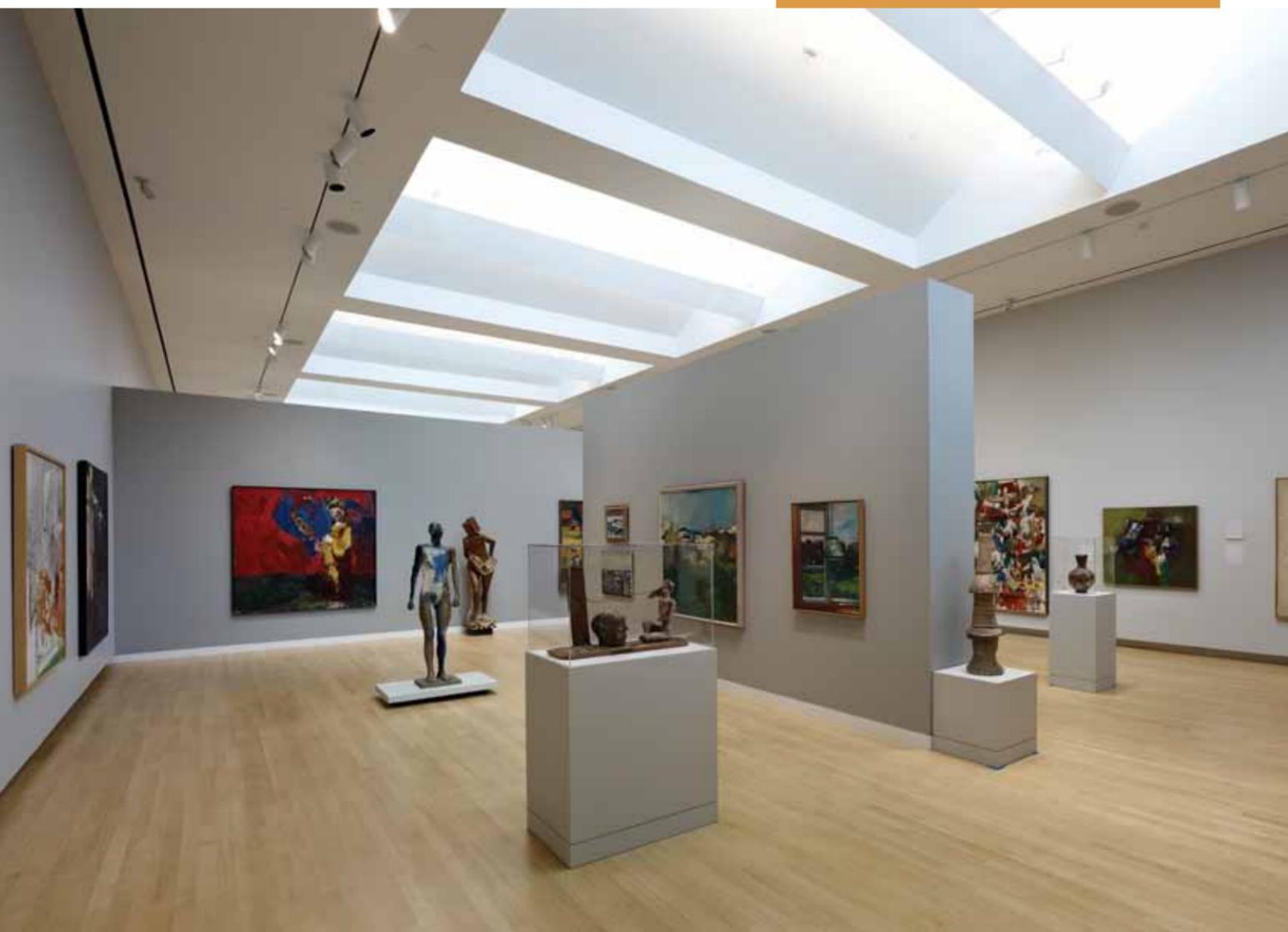
Conscious of the environment, the Design-Build team will preserve a historic tree by incorporating it into the overall design. The tree is protected with a half-circle setback on Grape Street. In addition to saving the tree, the Sharp Rees-Stealy Wellness Center will incorporate sustainable features to achieve a LEED Silver NC rating from the U.S. Green Building Council (USGBC).

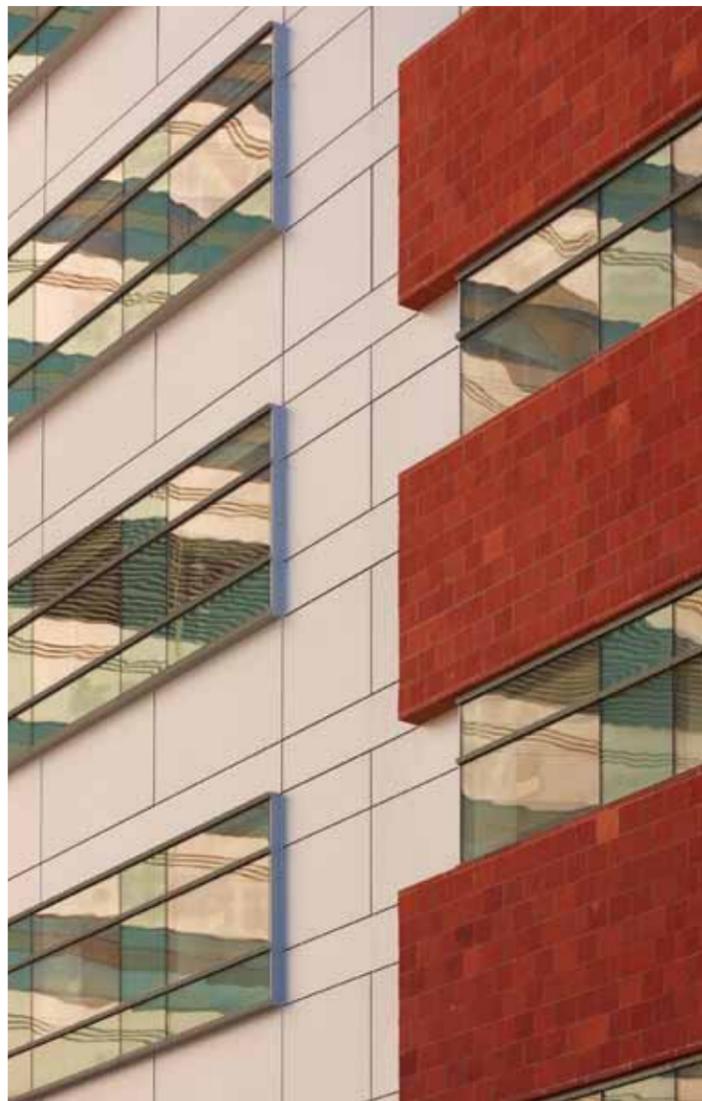
Rudolph and Sletten will also construct a 300-stall parking garage with one level below grade and 4 levels above. Construction is set to begin early next year. The new facility will be located adjacent to Sharp Rees-Stealy Medical Group’s current operations at 2001 Fourth Avenue.

“Sharp Rees-Stealy is thrilled with the design for our new Downtown Medical Center. The bold new concepts set the stage for our next century of service to the downtown San Diego community.”

— Donna Mills,  
CEO Sharp Healthcare

Owner: Sharp HealthCare  
Design-Build Team: Rudolph and Sletten and AVR Studio  
Size: 66,000 sq ft  
Completion date: 2012





As general contractor, Rudolph and Sletten used communication and collaboration to enable the construction team to meet challenges while maintaining long-term focus on the vision of building a family-centered care facility.

## Rudolph and Sletten Completes Construction of Childrens Hospital Los Angeles' New Hospital Building

At approximately 480,000 square feet in size, the new seven-story, 317-bed hospital building at Childrens Hospital Los Angeles includes an emergency department and trauma center with 30 private exam rooms; leading edge imaging facilities; a 48-bed acute care hematology/oncology unit and a 14-bed bone marrow transplant unit; a 24-bed cardiothoracic intensive care unit and a 21-bed acute heart care unit; a 24-bed pediatric intensive care unit; and a 58-bed newborn and infant critical care unit. There are also 128 additional medical and surgical acute care beds.

“Working as a team with the owner and architect early in the process gave the project a huge advantage. Our ability to make decisions collectively using a “project first” mindset and a clear set of guiding principles developed a unified vision for the duration of the construction project.”

— Martin Sisemore, President and CEO of Rudolph and Sletten



Full-scale mock-ups of PICU, NICU and acute patient rooms were built using a variety of proposed finishes, medical equipment and furniture options. Childrens Hospital Los Angeles' Family-Centered Care Committee, a group of patients and parents toured the mock-ups and provided frank and constructive feedback, which resulted in improved functionality and increased privacy, while eliminating construction cost on the order of 5 to 1 when compared to the cost of the mock-up construction. The approved mock-ups became the “benchmark” for quality on the project and the basis for the multiple “first install” rooms throughout the building.

The mock-ups allowed for the creation of customized prefabricated elements such as headwalls. Previously limited to catalog choices, the team's



innovative approach allowed for the customized headwalls to be mass produced at an offsite location, where they were fully tested and inspected, bundled and prepared for onsite installation as a unitized component. The “plug and play” method of assembly and installation reduced cost and schedule, while providing the client with the exact headwall they required.

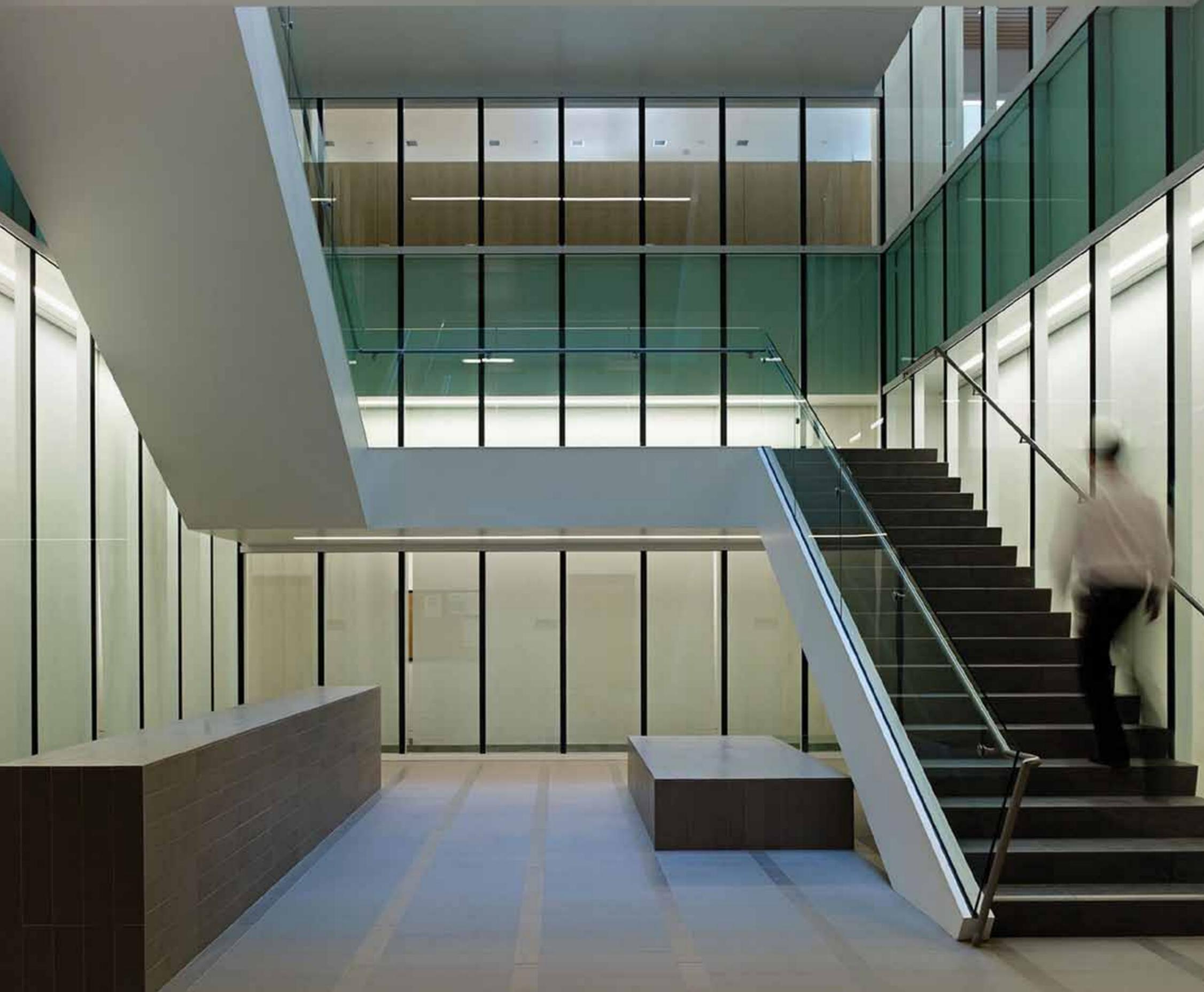
To achieve a facility that more fully integrates parents into their child’s care, the new building features spacious private rooms, designed with three distinct areas: a clinical area that houses sophisticated medical equipment; a family area that includes space for parents to stay overnight; and a patient area that features lighting and designs to help make children feel at home.

“By building a facility that allows families to heal and learn together, helps them to learn about the challenges of the particular illness or injury and makes it easier to manage their lives, we empower them to be better caregivers, better parents.”  
 — Mary Dee Hacker, RN,  
 Vice President and Chief Nursing Office for Childrens Hospital Los Angeles.

Children can visit Chase Place playrooms for therapeutic play. Teenagers have a lounge that includes a media center and a kitchenette, as well as space for computer games, arts and crafts, and more. Dining facilities on the ground floor open onto spacious gardens. The hospital building also features a convenience store open 24-hours-a-day. A state-of-the-art Family Resource Center provides information for parents about their child’s health care needs so that they can participate more fully in caregiving. The project also included a 3-level, 201-stall parking structure, an emergency generator building and a central (chiller) plant expansion.

“Our community needed this new hospital building at Childrens Hospital Los Angeles and our team, consisting of ZGF Architects, CLEO Construction Management and Rudolph and Sletten, met the demand by building the finest medical and surgical environment for seriously ill and injured children anywhere in the United States.”  
 — Richard D. Cordova, FACHE  
 Childrens Hospital Los Angeles President and CEO

The completion of this new Hospital Tower represents the fourth major new construction project that Rudolph and Sletten has built at this campus over the previous decade. Past projects include the Marion and John E. Anderson Surgery Center, the Saban Research Institute and a major underground parking expansion.



## INTEGRATED PROJECT DELIVERY MODEL

with Lean construction methods

Following an integrated project delivery model with Lean construction methods, the use of BIM technology and an incentive program, Rudolph and Sletten completes University of California, San Francisco's new Smith Cardiovascular Research Building in Mission Bay 10 weeks early.

The new, five-story, 236,000-square-foot collaborative center for the world-renowned UCSF Cardiovascular Research Institute and the new UCSF Center for Prevention of Heart and Vascular Diseases with an outpatient facility will focus on advancing ways to predict and prevent these devastating illnesses. The facility brings basic research scientist and clinicians together under the same roof, thereby accelerating their efforts to understand cardiovascular diseases, such as heart attack and stroke.

Designed by the SmithGroup, along with San Francisco-based Jim Jennings Architecture, the L-shaped center features flexible lab space spread over three floors for nearly 500 researchers. The layout generates office "clusters" on each floor. The offices were placed together to promote interaction among building users, enhanced by a centrally located glass-enclosed area where researchers will be able to meet and dine together.

Innovation on the project began early when UCSF chose to use the best value selection process as a standard in the procurement of the general contracting services as well as the design build subcontractors. The best value

Owner: University of California, San Francisco  
Architect: SmithGroup; Jim Jennings Architecture  
Size: 236,000 sq ft  
Completion date: 2010



process recognizes that there is value in experience, team members, safety records, and other aspects of the job rather than just cost. This holistic approach to selecting a contractor leads to a higher quality product, fewer change orders, and promotes a team atmosphere.

Lean construction techniques, such as the big room and Last Planner™, added value by reducing waste. The big room trailer gathered all designers, contractors, and the owner in one location to promote communication and teamwork. Last Planner provided a framework that promoted scheduling input from many levels, all the way down to the foreman in the field.

“Through the implementation of the Last Planner system and collaborative planning, the project was completed on time and within budget,” said Danielle Douthett, Senior Project Manager for Rudolph and Sletten. “The phase scheduling techniques that were employed allowed the field foreman to be invested in the outcome of the project and make a real commitment about their performance.”

Last Planner started with the master schedule covering the entire project, followed by a detailed phase schedule emerging from collaborative planning and a very detailed weekly work plan. This process identifies the critical activities and best sequence of tasks for the entire team not just one individual party. Throughout these sessions, Rudolph and Sletten implemented 3D Building Information Modeling (BIM) for coordination between trades, sequencing of tasks and to fully understand the scope of each trades’ work within an area. From the schedule, weekly work plans were measured for percent plan complete thereby providing for accountability and learning from every experience. When negative trends are identified, questions were asked to locate the root of the problem so that changes could be implemented to improve the percentage for subsequent weeks.



photos: ©2010 Bruce Damonte

“Planning was key in the successful on-time completion of such a complex building,” said Douthett. “The exterior skin alone was a complex undertaking consisting of eight different materials installed by different subcontractors.”

The \$25.5-million exterior system is made up of different materials and systems procured from many different sources around the world. The building’s skin boast travertine stone from Italy; terracotta tile and baguette’s from Germany; metal panels from Colorado and Pennsylvania; a polycarbonate wall system and mechanical roof screens from Pennsylvania; aluminum curtain-wall system and a unitized curtain-wall system from Fremont, Calif.; glazing from Minnesota; glass from China; and aluminum sunshades from Texas. To help keep track of the many different materials and systems, Rudolph and Sletten implemented a design-build delivery method for the exterior skin.

The building is pursuing LEED gold certification. The project’s LEED features include:

- green roof
- low-flow fixtures and waterless urinals
- an Energy Star reflective roof
- 75% of construction waste diverted from landfills
- the usage of 20% of recycled materials
- 3ft-thick underground stormwater control gravel basin

Designed to be UCSF’s first LEED certified building, the project provides open laboratories for 48 principal investigators with flexible enclosed support areas and offices spaces spread on the three middle floors. The first floor contains administration, common and meeting areas and the top occupied floor houses the vivarium. The building’s architecture facilitates, encourages, and enhances the principals of collaboration and efficiency—cornerstones of success in research.

“UCSF achieved substantial completion 10 weeks earlier than the original as-planned schedule. This achievement has been facilitated by the University’s Integrated Project Delivery model. Incorporating Lean construction, use of BIM technology and Incentive programs --- and of course an exemplary Project Team of Design and Construction Professionalism who have worked so diligently on this project.”

Michael Bade, (Interim) Assistant Vice Chancellor,  
Capital Programs, University of California San Francisco





Helios Research Facility  
Owner: University of California, Berkeley  
Architect: SmithGroup  
Size: 113,000 sq ft  
Completion date: 2012

“Rudolph and Sletten is excited to be back on the UC Berkeley campus building another LEED-targeted modern laboratory. We have become known for our ability to successfully collaborate on the construction of complex modern laboratories like this one. Last time we worked with UC in Berkeley, we won the Secretary of Energy’s Excellence in Acquisition Award for our work on the Lawrence Berkeley National Molecular Foundry Nanoscience Laboratory.”

— Martin Sisemore  
President and CEO, Rudolph and Sletten

## Helios Energy Research Facility UC Berkeley

LEED-targeted, Alternative Energy Research Facility  
and the Energy Bioscience Institute

Rudolph and Sletten has begun construction on the 113,000-square-foot Helios Energy Research Facility for the University of California, Berkeley in downtown Berkeley. The project will house wet laboratories for molecular and microbial biology, fermentation, and chemical separation, as well as greenhouses, warm and cold rooms, shared instrumentation space, offices, workrooms, and conference space.

Accommodating biofuels research and development, the Helios facility will house the

Energy Biosciences Institute (EBI), a unique collaboration of academia and industry using biotechnology to develop potential carbon-neutral fuels and to test new means of carbon sequestration, in the quest to help reverse global climate change. Researchers in the EBI examine biofuels’ potential environmental, social and economic impacts, asking questions in subjects that include agronomy, microbiology, mechanical and chemical engineering, biochemistry, chemistry, geography, economics, law and policy analysis. When completed, the project

will bring together staff members that are currently scattered in different buildings across the campus.

Bounded by Oxford Street and Shattuck Avenue on the east and west and Hearst Avenue and Berkeley Way on the north and south, the five-story Helios Energy Research Facility will replace an abandoned Eisenhower-era institutional building abutted by parking lots. The east half of the property will have been transformed into a modern, accessible space in keeping with the City of Berkeley’s goals for downtown renewal. Among other improvements, it will offer neighbors a public park-like area on the south, as well as a wide pedestrian pathway reconnecting Walnut Street.

The Helios Energy Research Facility architect is SmithGroup with Research Facilities Design as laboratory design consultant. Completion is slated for fall of 2012.



renderings by SmithGroup

**Rudolph and Sletten**

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# HOOKED ON CONSTRUCTION

## 50 years *of* BUILDING trust, innovation, and technology

From a humble beginning in Rudy's garage, Rudolph and Sletten has grown into a leader in California construction. Over the past 50 years, we have expanded along with our neighbors in Silicon Valley, brought technology and innovation to construction and led the state in "green" construction. Our accomplishments are due to our forward-thinking and sometimes demanding clients, as well as our talented, well-trained staff. The combination has made for a very successful 50 years and a great reason to celebrate.



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