

STANFORD UNIVERSITY SCHOOL OF MEDICINE

LI KA SHING CENTER
FOR LEARNING AND KNOWLEDGE

PALO ALTO, CALIFORNIA

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Li Ka Shing Center for Learning and Knowledge
Palo Alto, California

ACTIVE LEARNING

The NBBJ-designed Li Ka Shing Center is helping Stanford University School of Medicine recalibrate the way medical education is conducted, while providing a fresh architectural interpretation of Stanford University's design guidelines.

Vision

Stanford's School of Medicine recognized the potential of next-generation technology to revolutionize the way knowledge is developed, shared and applied. The school embarked on the development of a new curriculum and facility that would bring learning and knowledge to life by making it an engaging, active experience.

Breakthrough

The Li Ka Shing Center for Learning and Knowledge (LKSC) advances the concept of a "whole student environment" by weaving together student-life amenities and an array of flexible spaces with an advanced technology infrastructure that facilitates new modes of collaboration, communication, and cross-disciplinary interaction.

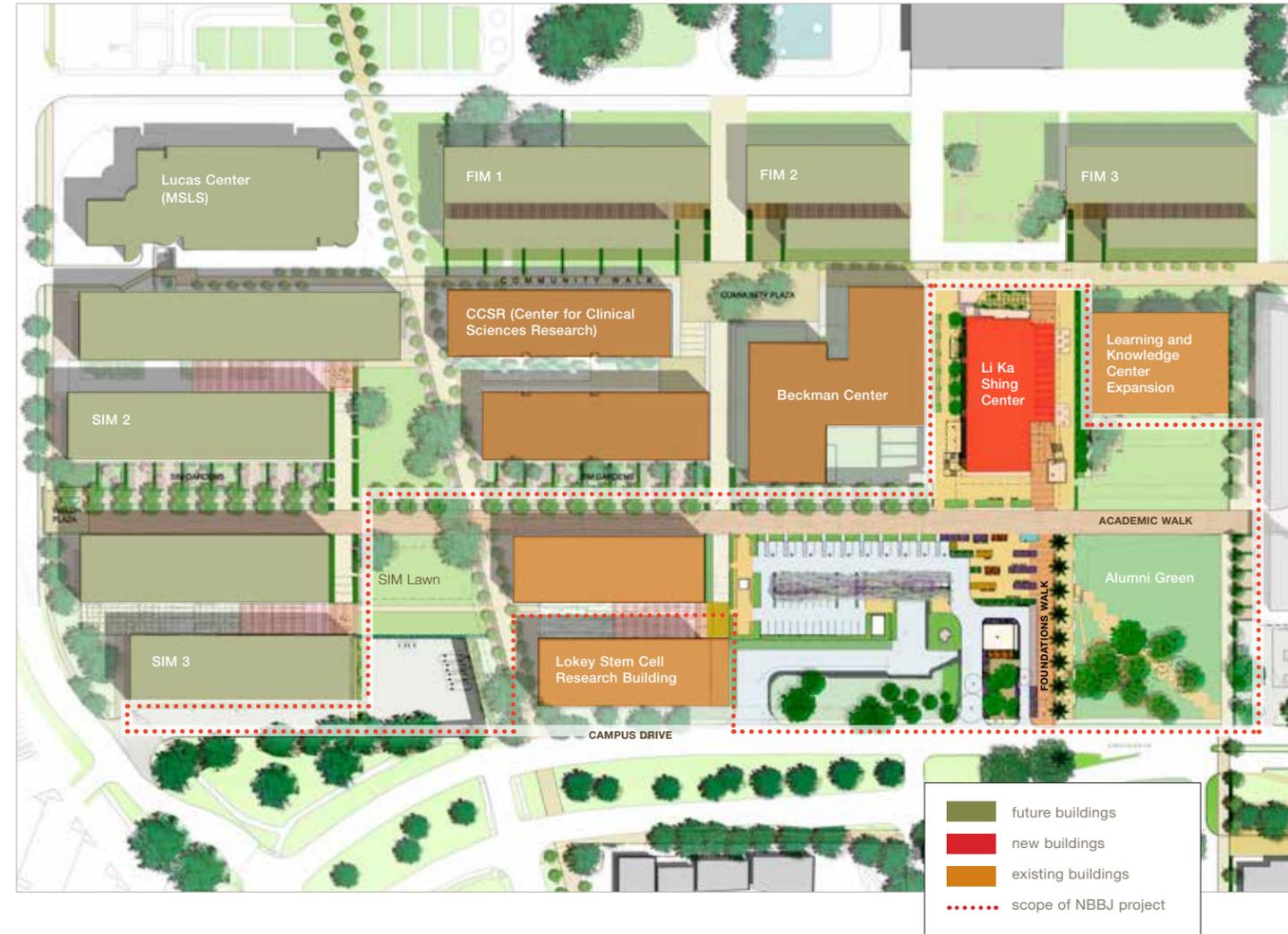
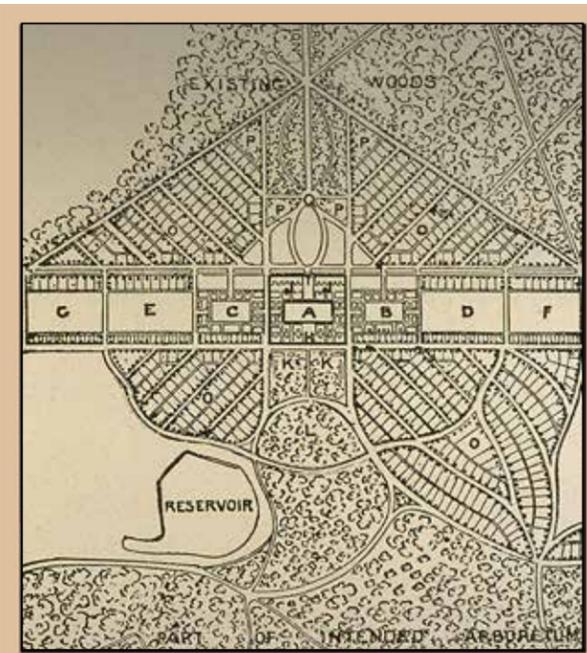
Value

The LKSC acts as a versatile and adaptable platform for future pedagogies in medical education by creating a range of environments to support a curriculum that melds the study of basic science and the clinical practice of medicine into a cohesive learning program.

Insight

Attracting top students and preparing these future leaders of medical research and practice involves a wide range of passive and active learning activities – in particular immersive, simulation-based training that bridges the gap between education and real life doctor-patient interactions.





1888 Olmsted Plan

At the time, the master plan (above) was unlike American campuses in both its large scale and its highly formal and monumental organization around a series of axes. A mile-long palm-lined drive leads to the spacious quad. Plans for future growth cite additional quadrangles to the east and west—all set within great expanses of parkland.

Architectural Heritage

The new buildings mark an update of the tan walls and red-tiled roofs that defined early Stanford architecture. Sandstone gave the Main Quad its distinctive look, which is reminiscent of early Spanish missions. Now, Lutetian limestone, paler in shade and harder to the touch, has become the modern face of Stanford's cutting-edge facilities.

REASSERTING OLMSTED'S VISION

The Li Ka Shing Center is the school's first new education building in fifty years, and is distinctly different from its previous home in terms of technology, architecture, physical setting and the educational philosophy on which it is built.

As a keystone of the School of Medicine's new facilities master plan, the five-level, 120,000-square-foot LKSC strengthens the school's identity within the campus and its collaborative connections with adjacent academic programs and the larger medical research community.

LKSC's modern, limestone-clad form and red-trim roof pays homage to Stanford's architectural heritage, while establishing a contemporary presence that signals a new era for the School. Situated at the crossroads of Stanford's Science and Engineering quad and Medical Center, the LKSC building serves as a nexus between these collaborating programs, and anchors the Academic Walk around which the renewed medical school will grow. It also helps to reassert the formal vision of Stanford's campus plan, originally designed by Frederick Law Olmsted.

ANCHORING TO THE CAMPUS

NBBJ's master plan concept creates key open space elements that organize the School of Medicine and better integrate it with the campus. The building's entry façade lends definition to the tree-lined, east-west Academic Walk that unifies the quad, while the Foundations Walk connects with the Medical Center and Science and Engineering quad.

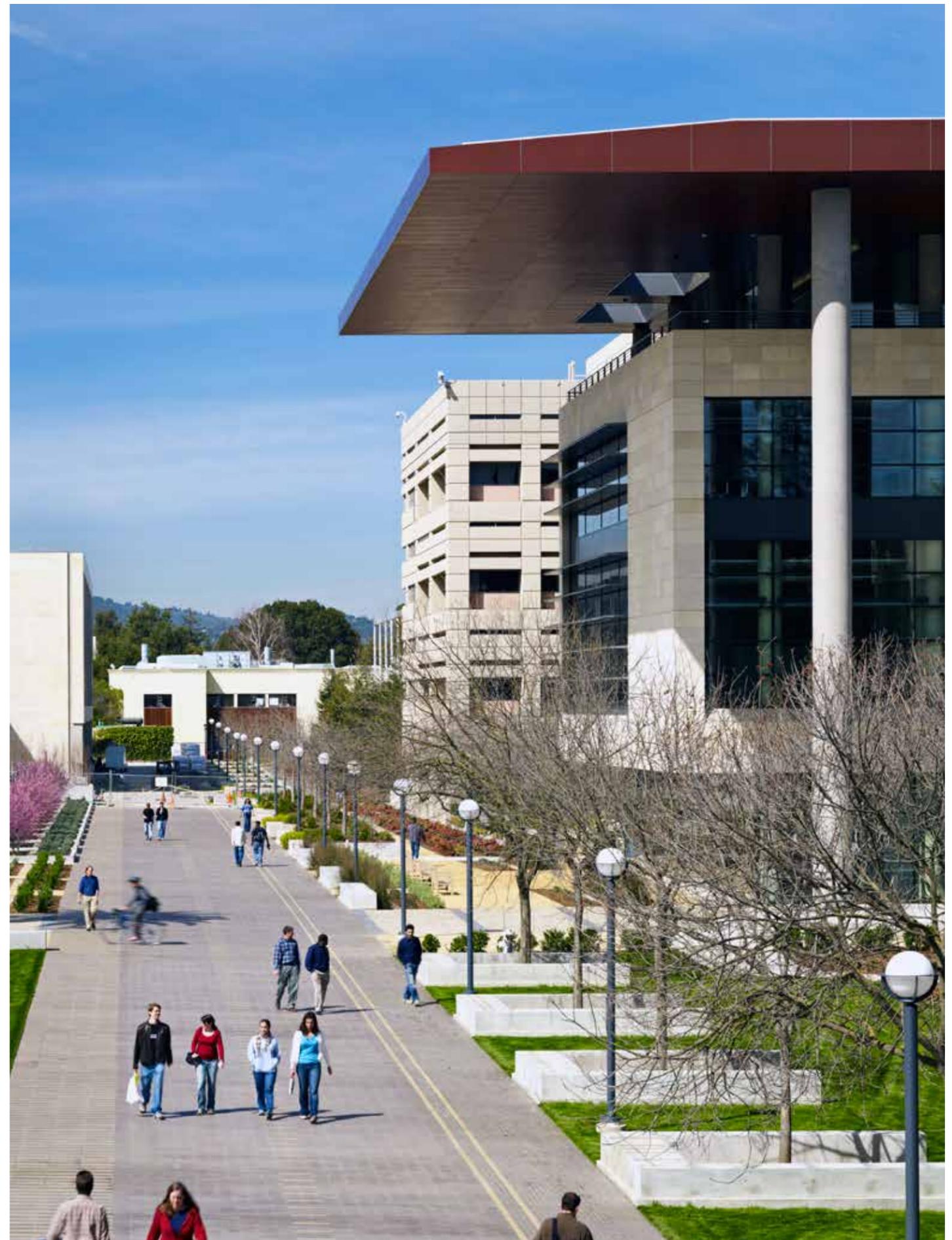
"The Olmsted plan was all about making clear connections as the University grew. Today, with people from the School of Medicine working closely with their counterparts in biology and chemistry, it's really important that their spaces connect—and that it's clear how to get from one to another."

— DAVID P. LENOX, UNIVERSITY ARCHITECT AND DIRECTOR OF CAMPUS PLANNING



A PLACE FOR PEOPLE

A poorly positioned loading dock in front of the LKSC was relocated to make room for the Dean's Lawn, which, along with the entry plaza and building, defines a clear front door for the School. Existing parking and a lane for vehicular traffic was also relocated so that the Academic Walk could further enhance the area and its role as a place for people.





COLLABORATIVE PROCESS LEADS TO SIGNIFICANT SAVINGS

The LKSC was designed and constructed through a close partnership with the client, architect and contractor. This collaborative approach fostered working relationships among the project team, including subcontractors, and created a shared commitment to excellence and open communication.

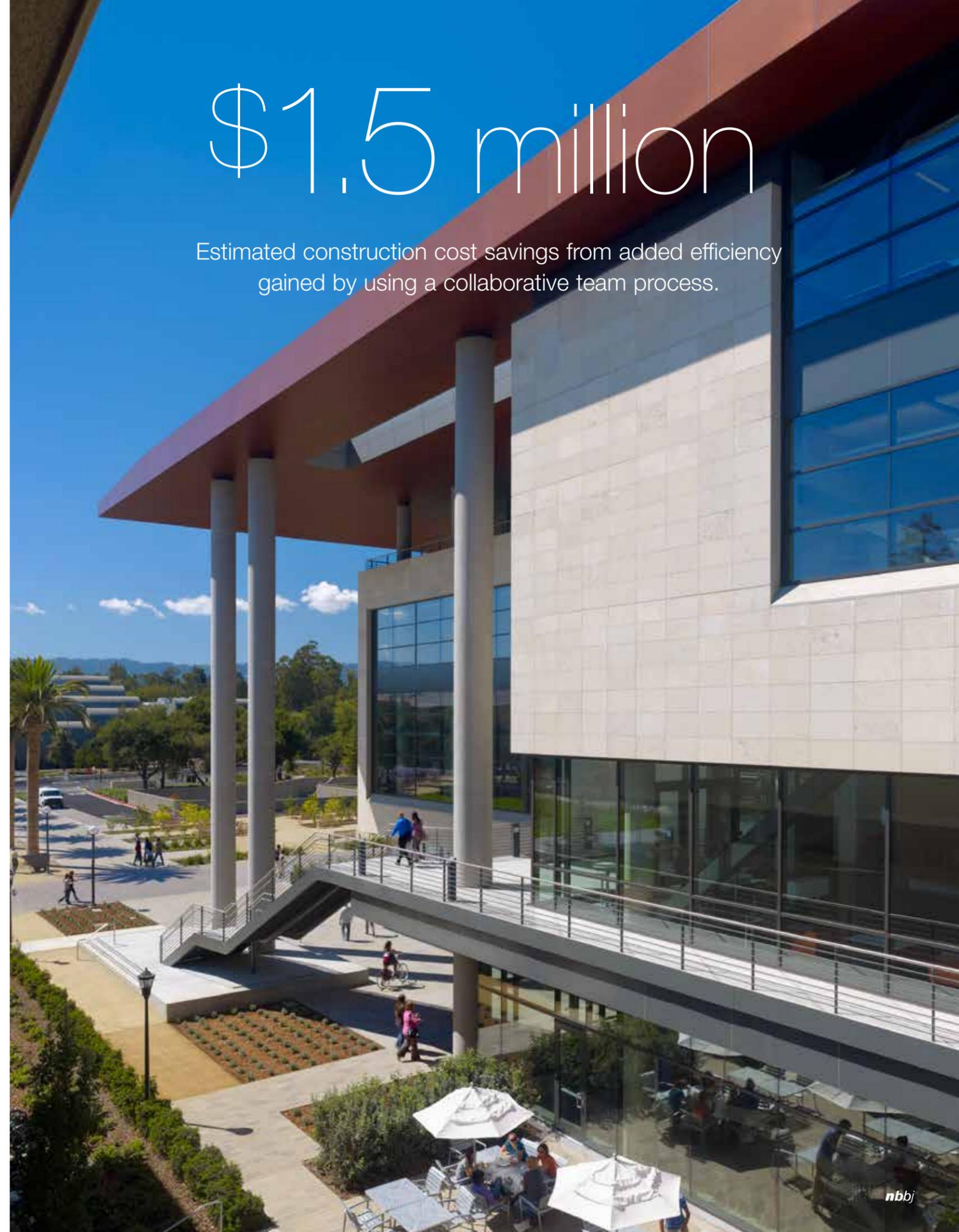
From the start of schematic design, NBBJ and the contractor, Whiting Turner, worked together in planning the project's constructability, schedule and cost. The architect and contractor team members coordinated efforts during the design development and construction documentation to develop primary interior and building components.

The subcontractors provided detailing for building elements, such as the exterior enclosure, which created efficiencies in

the documentation and shop drawing review processes. This level of collaboration resulted in an estimated savings of \$1,000,000 in buyouts, \$200,000 in early procurement of steel and metal decking and \$300,000 in BIM-related prefabrication. These efficiencies brought by the team's collaborative efforts enabled the project to be completed on schedule and under budget.

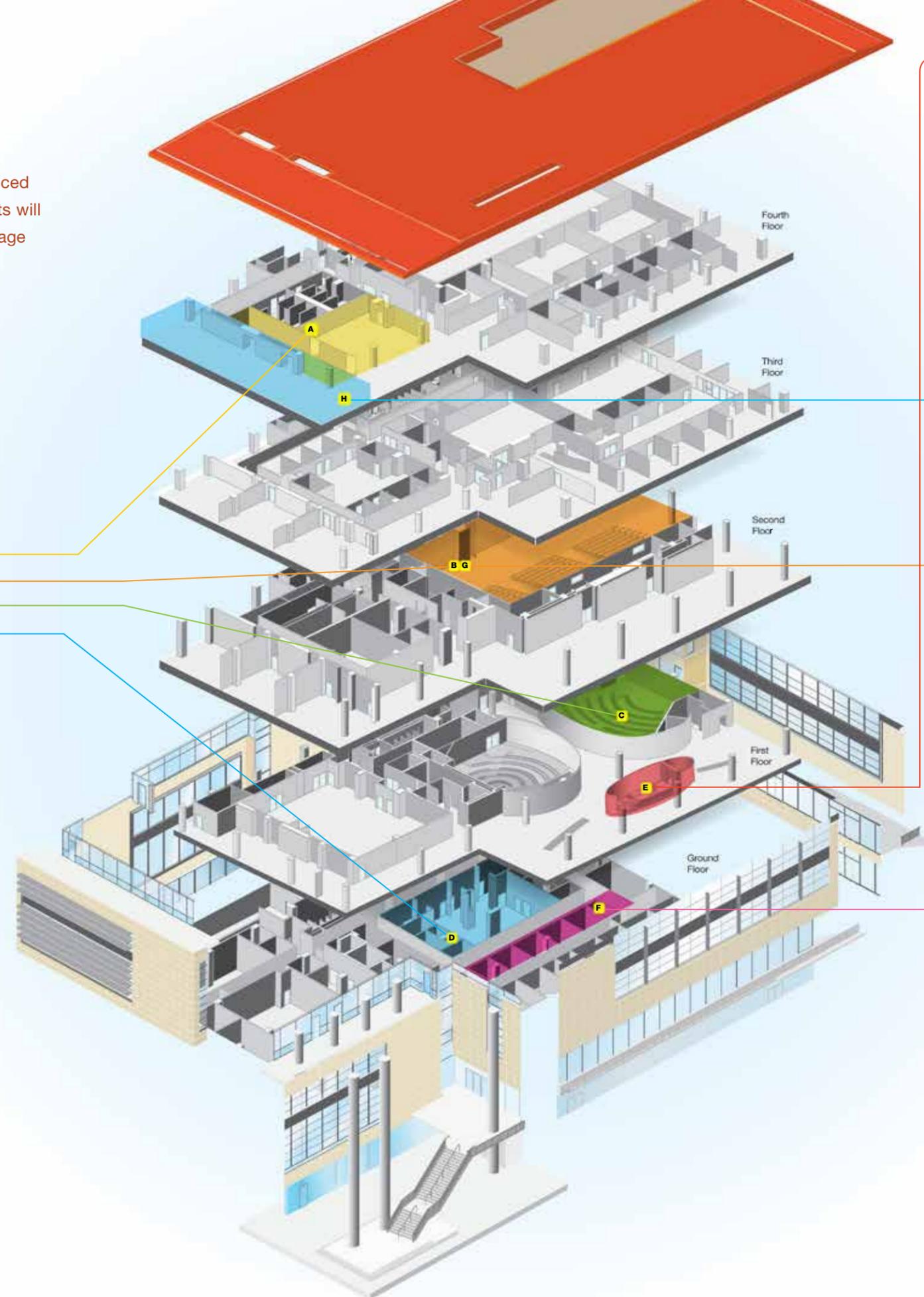
\$1.5 million

Estimated construction cost savings from added efficiency gained by using a collaborative team process.



A DAY IN THE LIFE

The LKSC supports a 24-hour learning environment, while fostering a balanced student life and an extended research community. On a typical day, students will benefit from a comfortable learning environment that is designed to encourage interaction among undergraduates, graduates, faculty and researchers.

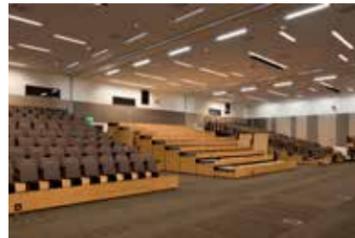


7 AM

A

Wake up Energized

Hit one of the elliptical machines in the student lounge fitness room to start the day. Make breakfast in the kitchen. Before heading out, log on to secured computers to check on the status of patients you've seen on medical rounds.



8 AM

B

Grand Rounds

Attend a lecture by a visiting scholar at the Department of Medicine Grand Rounds.



9 AM

C

Lecture Dynamics

Attend class in one of the two halls on the first floor. The lesson is automatically recorded and can be broadcast on monitors throughout the building, as well as being available for review later. An in-class polling system allows the instructor to interact with the entire class.



11 AM

D

Virtual Hospital

Go to the Center for Simulation and Immersive Learning, where an entire floor of mock hospital environments train students and physicians for a variety of medical situations, from disasters with multiple traumas to heart surgery. Give injections and hook up an IV to one of the computerized mannequins. An instructor controls the mannequin's responses from another room and speaks as the patient through a microphone in the dummy.



1 PM

E



Refueling

Grab a sandwich and a latte at the café, and get ready for the afternoon's activities. Stop by the Medical School store to buy Stanford sweatshirts to send to your parents.



2 PM

F



The Human Touch

Appointment with a "standardized patient," an actor who portrays an assortment of conditions, in one of the 10 exam rooms that comprise the virtual hospital on the ground floor. Your exam is recorded and afterwards, an instructor reviews your work with you in a nearby conference room.



5 PM

G



Dinner Theater

Attend a dinner-lecture honoring one of your professors. The conference room has been transformed into a banquet hall that seats 300 people. Dinner is prepared in the adjacent kitchen.



7 PM

H



Room with a View

Time to study. Use the video facility in the student lounge to practice a presentation due later in the week. Consult a librarian through the LKSC branch of Lane Medical Library for help on researching a project. Move to a comfortable chair on the balcony to read while enjoying a stunning view of the Santa Cruz mountains.



CULTIVATING MULTI-MODAL LEARNING

Caring for real human beings is an active process. Preparing students, interns, residents and experienced physicians for the rigors of medical practice requires facilities that promote active learning. To address the technical and experienced-based knowledge that comprises a medical education, the LKSC combines traditional and innovative environments with maximum versatility.

Classrooms and conference facilities can be reconfigured for varied group sizes and activities, while simulation labs provide active training. Social spaces are integrated throughout the building, encouraging the valuable exchange of knowledge that often occurs during casual interactions.

1: Flexible configuration of seminar rooms allows for lectures and group-based learning.

2: Project classrooms are used for group clinical skills training.

3: Ubiquitous technology advances the building's programmatic flexibility and links to research partners worldwide.

4: Technology supports everything from presentations to real-time observation of a simulation exercise.

5: A building-wide, high-definition video system records and transmits all classes to the School, campus and beyond, creating a valuable archive for students and researchers.

6: Informal spaces that allow for breaks and promote interaction—from the main floor café to flexible seating in the student lounge—are dispersed throughout the building and reinforce the social dimension of learning.



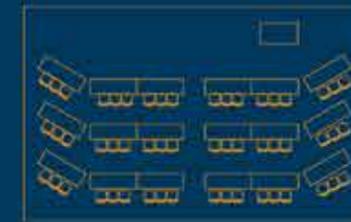
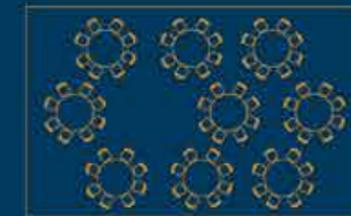
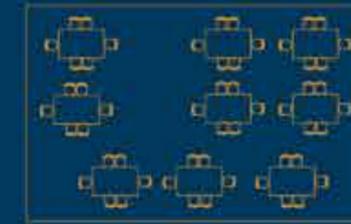
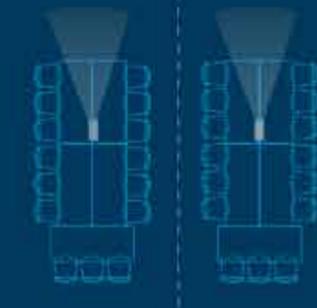
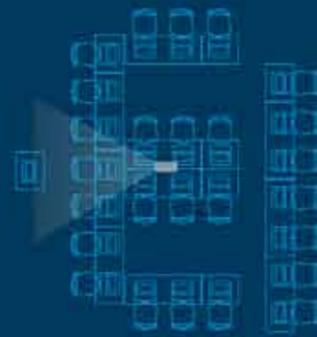
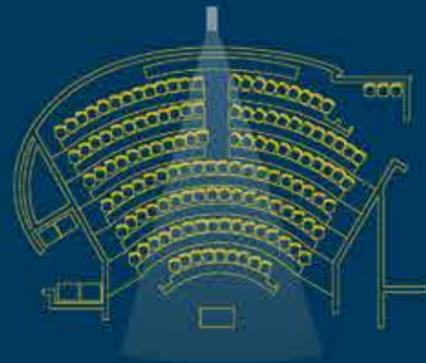
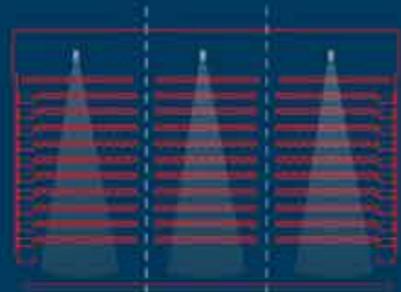


Student and faculty presentations are archived for future reference and use, and a network of high-definition video cameras and projectors enables instant data sharing anywhere in the building.

DYNAMIC CLASSROOMS AT ALL SCALES

As faculty moved into the LKSC, they were introduced to an array of new classroom configurations that incorporate “team-based learning,” where groups of students work together to solve a series of challenges with varying difficulty. The design team’s challenge for programming classrooms was to ensure that a variety of learning spaces accommodates multiple learning modalities—case style, team-based learning and lecture style. Post-occupancy

observations from an early prototype showed that team learning classrooms are used 65% of the time for case style, 33% for team-based and 2% lecture format. Staff reconfigured the room more than once a day and reconfiguration happened quickly. Students reported a high degree of satisfaction with the team-based classroom setting because it is more intimate and less intimidating than a lecture hall.



a Conference Center

b Lecture

c Standard Seminar and Divisible Seminar Classrooms

d Project Classroom

e Studio Classrooms

f Study Spaces

One large, “ballroom” space for 350 people is used for conferences, meetings and hosting dining events. The space has retractable theater-style seating and can divide into three smaller rooms of 120 each.

Two large tiered lecture halls with fixed tables and movable chairs seat 120 and 130. Every seat includes data and power.

Seven seminar-style classrooms seat 35 and feature flat-floored space with movable chairs and tables. Three of the rooms can be divided for more intimate classes that seat up to 17.

Clinical Skills Training takes place in the 85-seat project classroom. It can also be used for lectures.

Two studio classrooms support team-based learning. With multiple screens around the room, small groups can work in clustered teams. The space divides into two and seats 68 in each, or 140 when open.

Study carrels and single study rooms are located on LKSC’s top floor for heads-down research and studying.



IMMERSIVE LEARNING ENVIRONMENTS

The Immersive Learning Center brings together all modalities of simulation into one place. Designed in close collaboration with the lab's Associate Dean, Dr. David Gaba, the facility stands apart as one of the most innovative and largest labs in the world. It allows students to integrate their classroom learning in parallel with simulation-based practice. The ground floor creates a virtual microcosm of a hospital for a variety of learning experiences, addressing different aspects of cognitive and psychomotor skills.

1: A RANGE OF SETTINGS

Students train for a variety of patient care activities with specially trained "standardized patient" actors in 10 clinic rooms.

2: LEARNER EXPERIENCE

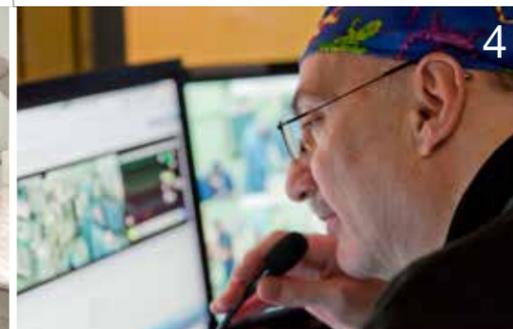
Programmable to any level of expertise, mannequin-based simulation is an adjunct to training with patient actors.

3-4: FREEDOM TO MAKE MISTAKES

The spaces are designed so that specific medical procedures or surgical operations can be practiced until the learner is competent. The space allows for diverse scenarios from seeing a single patient to dealing with many patients at once, even mass casualty situations.

5-6: DETAILED FEEDBACK AND EVALUATION

Adjacent to simulation rooms, control and debrief rooms offer environments where learners receive immediate feedback by reviewing videotape or debriefing with their instructors and peers as they evaluate their decisions and actions. By seeing the outcome of their mistakes, learners gain powerful insight into the consequences of their actions.

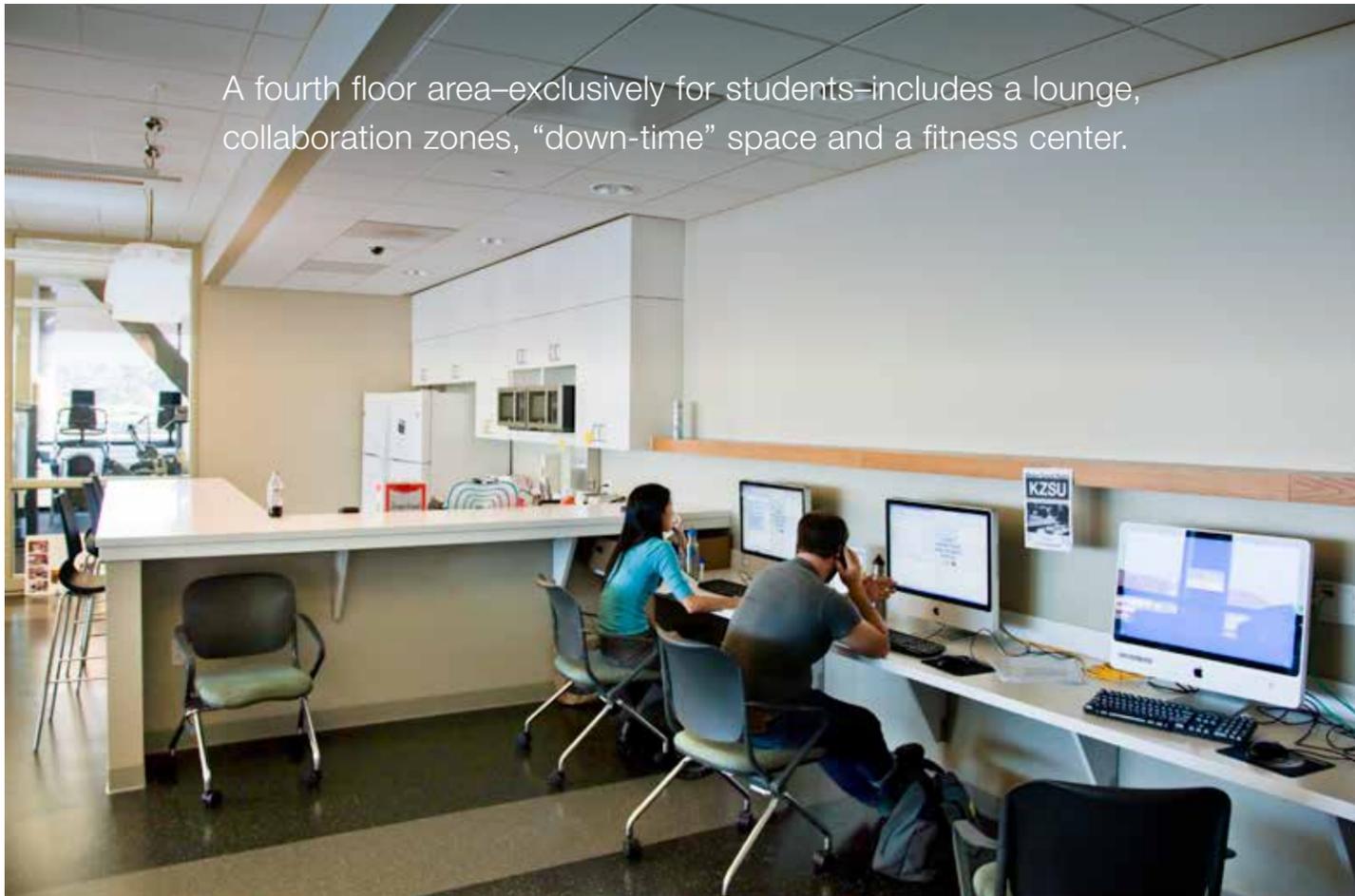


VIRTUALLY REAL

In the simulation labs, faculty and researchers devise specific training scenarios—patient-doctor interactions using actors, team-based responses using computerized mannequins, and virtual reality exercises for specific procedures—then use video to provide feedback and engage students about what they learned.



A fourth floor area—exclusively for students—includes a lounge, collaboration zones, “down-time” space and a fitness center.



The first floor includes a café with outdoor seating and a bookstore.





The white roof with red trim and high-quality glass are designed to deflect heat and reduce energy use.



By using displacement air systems, cooling comes from below in the large lecture halls, reducing energy use.



Reclaimed or "gray water" from the Stanford campus is used in all toilet fixtures.



Automatic sensors switch off lights when rooms are not in use.

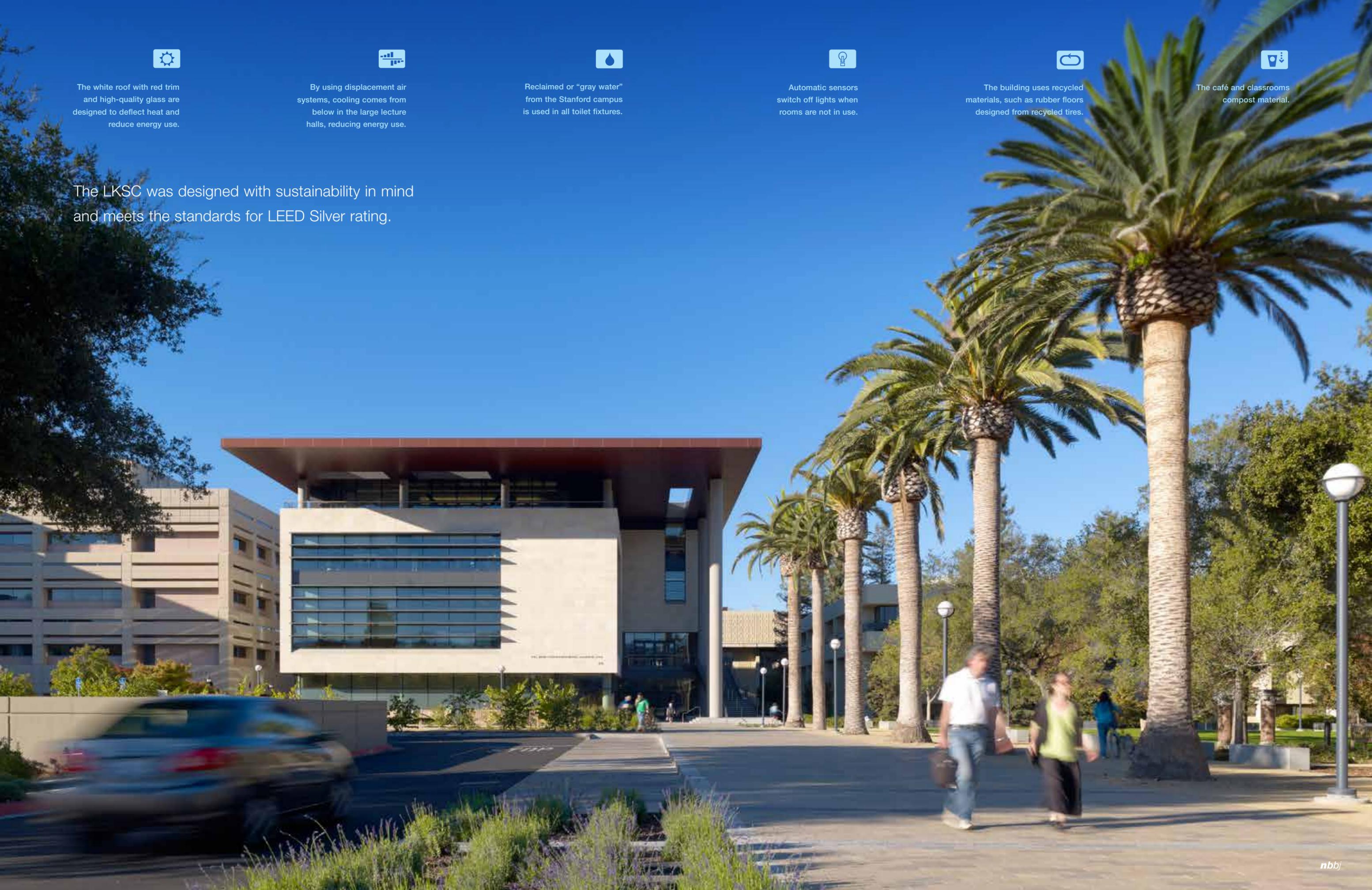


The building uses recycled materials, such as rubber floors designed from recycled tires.



The café and classrooms compost material.

The LKSC was designed with sustainability in mind and meets the standards for LEED Silver rating.



“We wanted this to be a place that would bring our community together. One of the things I’m very happy with is that medical and graduate students are interacting more in this building. And that connection really forecasts the future of science and medicine well.” – PHILIP A. PIZZO, M.D., DEAN, STANFORD SCHOOL OF MEDICINE

CLIENT
Stanford University

SIZE
120,000 SF

COMPLETION DATE
2010

SCOPE
Classrooms, café, lecture halls,
conference area, executive
office suite, simulation center

NBBJ SERVICES
Master planning, programming,
full architectural and interior
design services

PUBLICATIONS
Metropolis Magazine,
“Bedside 101,” October 2011

SUSTAINABILITY
LEED Silver Certified



ABOUT NBBJ

NBBJ is an award-winning global design and architecture firm focused on helping clients capitalize on the relationship between people and the design of physical space to enhance organizational performance.

From academic research and university medical schools to simulation centers and campus planning, NBBJ is a global leader in creating performance-based learning environments. Consistently recognized by clients for our creative and professional design process, NBBJ has partnered with 12 of *U.S. News & World Report's* Top 25 Universities, including Harvard, Stanford, Duke and the California Institute of Technology. Our expertise encompasses multiple disciplines, with architects, lab specialists, economists and sustainability experts working together to design innovative centers for learning.

NBBJ's network of offices enables us to deliver quality projects that are regionally and locally appropriate. It allows us to act as a single creative force—leveraging the latest thinking from NBBJ colleagues in other locations, bringing a rich blend of expertise to each project.

NBBJ SERVICES

Architecture	Land-Use Planning
Change Management	Lighting Design
Construction Administration	Master Planning
Interior Design	Programming
Facility Planning	Project and Cost Management
Financial Analysis	Retail Planning and Design
Graphic Design and Signage	Space Planning
Laboratory Design	Workplace Consulting

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