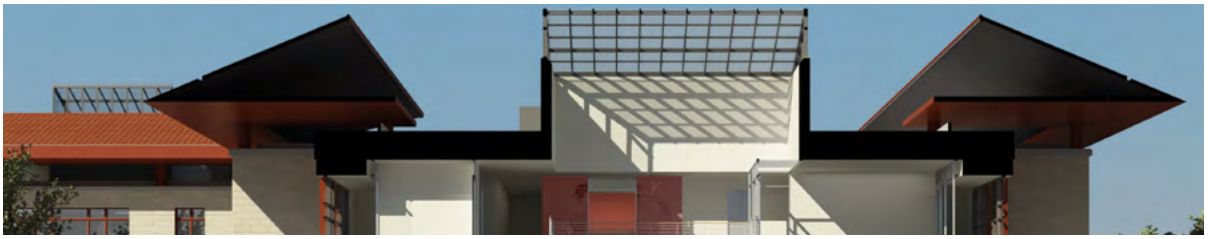
FACT SHEET: GREEN BUILDINGS - NEW CONSTRUCTION



SUSTAINABILITY OPPORTUNITY

Fredrick Law Olmsted designed the original master plan for Stanford—a resource-conserving campus that would respond to its climate and context to achieve both beauty and functionality. Stanford's programs and guidelines regarding new construction incorporate Olmsted's vision in today's context with stringent performance goals, optimal space utilization, material reuse, lifecycle cost analysis, and education programs that showcase how Stanford's buildings are designed to conserve, inspire, and teach.

TOP INITIATIVES & RESULTS

Sustainability in the Built Environment

As described in Stanford's Project Delivery Process (PDP) manual, the university is committed to providing a sustainable and inspiring built environment for its students, faculty, staff, and visitors. At Stanford, sustainability refers to ensuring that buildings not only use energy, water, and other natural resources efficiently, but also provide a safe, productive, and educational environment. Stanford recognizes that the building industry has a tremendous impact on the natural environment, both regionally and globally, and the university has the opportunity to take a leadership role in how buildings are built to conserve resources and inspire users. This requires an integrated process with sustainability as a base criterion in all development stages. Stanford's PDP manual therefore incorporates sustainability through the Guidelines for Life Cycle Cost Analysis, salvage and recycling programs, and a strong emphasis on commissioning. In 2015, the university embraced a new method of benchmarking that allows for a more holistic, and also more rigorous, method for designing high-performance buildings. Stanford's new buildings are now designed to meet a whole-building, energy performance target. The target is unique to each new building, but based on performance of existing campus buildings of the same space type.

Core Sustainability Features

In the new high-performance buildings on campus, natural ventilation, sophisticated control systems, and daylight-focused design leverage Stanford's climate and maximize energy-saving opportunities. In addition, Stanford has expanded the service area for its recycled water system, which now sends cooling tower blow-down from the campus Central Energy Facility to flush toilets and urinals throughout more than one million square feet of the new high-performance buildings. The gradual proliferation of solar photovoltaic installations deserves special mention, with over 30 campus structures outfitted with solar photovoltaic panels on their rooftops.

Space Utilization

Rigorous space-utilization studies are conducted before each decision to construct a new building, ensuring a new space is added only when truly necessary. Stanford aims to recover five to ten percent of the space within existing campus buildings through conformance to Space Utilization Guidelines. In 2006, the university established a program where select schools pay a fee for underutilized space.

Life Cycle Cost Analysis

Stanford's Guidelines for Life Cycle Cost Analysis (LCCA) instruct design and construction teams to consider not only the "first costs" of a building but also long-term costs, including utilities, operations, and maintenance. The guidelines, established in 2005, interlace various sustainability principles with a life cycle costing mechanism to determine the economic performance of a sustainability feature over its entire lifetime (whole cost accounting / total cost of ownership).

Sustainable Demolition

Conscientious building demolition underscores Stanford's commitment to sustainability and demonstrates responsible management through the end of a building's life. Through a combination of selective salvage opportunities and extensive material recycling, demolition on campus strives to meet Stanford's sustainability goals and budget requirements, as well as minimize impact to the campus community. A balanced approach to each demolition project ensures that the building's legacy will continue to serve the university for years to come.

SUSTAINABLE STANFORD

FACT SHEET: GREEN BUILDINGS - NEW CONSTRUCTION

From original sandstone to systems furniture, Stanford targets material reuse on every project. During deconstruction, teams carefully salvage brick, sandstone, marble, and terra cotta roof tiles to ensure an available supply for redeployment across campus. The Crothers Memorial Dormitory and Automotive Innovation Facility projects made extensive use of salvaged bricks and pavers. Auditorium seats from Kresge Auditorium were relocated to their new home in SEQ2's Huang Engineering center. The award-winning Jasper Ridge Field station used 100% surplus casework, reused furniture and toilet partitions, salvaged bricks from campus, and redwood siding salvaged from a home in a neighboring community

Tours and Docent Programs

New construction projects provide an educational opportunity for the Stanford community and outside visitors. Therefore, tour and docent programs exist for the university's most successful high-performance buildings. The walking tours highlight all aspects of sustainability incorporated into new structures, from daylighting and natural ventilation to advanced monitoring systems and reclaimed water infrastructure.

RECENT HIGH-PERFORMANCE BUILDINGS

Surpassing Guidelines

Many recently complete high-performance building projects meet, or far exceed, energy and water efficiency recommendations outlined in Stanford's guidelines. Across the board, each subsequent high-performance building emphasizes the success of its predecessors and capitalizes on important lessons learned to achieve greater sustainability within the built environment.

- The anchor building of the interdisciplinary Science and Engineering Quad, the Yang and Yamazaki Environment and Energy Building (Y2E2), uses 42% less energy than code and 90% less potable water than comparable buildings.
- The Huang Engineering Center and the Center for Nanoscale Science and Engineering, Y2E2's counterparts in the Science and Engineering Quad, have achieved 42% and 37% aggregate energy savings, including plug loads, respectively.
- The Graduate School of Business's Knight Management Center is also expected to use 42% less energy than code, thanks in part to the university's largest solar photovoltaic installation, which provides 12.5% of the center's electricity demand. A portfolio of other high-efficiency sustainability features contributed to the 360,000-square-foot, eight-building complex's LEED-NC Platinum certification.
- Both the Lorry I. Lokey Stem Cell Research Building (SIM1) and the Li Ka Shing Center for Learning and Knowledge in the School of medicine prove that highly technical programmatic requirements benefit from high-performance design and construction. SIM1 will save nine million gallons of water annually through internal infrastructure improvements.

BUILDINGS UNDER CONSTRUCTION

Project Name	Gross Square-Footage	Expected Occupancy Date
ChEM-H & Stanford Neuro-sciences Institute (SNI)	235,000	Spring 2019
Bass Biology Building	123,000	Fall 2018
Redwood City Campus	1,500,000	Spring 2019
David and Joan Traitel Building	55,000	Winter 2017

AWARDS

- Architecture Award for the Central Energy Facility, American Institute of Architects, Portland Chapter (2015)
- LEED Platinum certification for Existing Buildings: Operations & Maintenance
- First Place, ASHRAE Technology Award, for the Environment and Energy Building (Y2E2) in the new institutional building category (2011)
- Green Project of the Year, for the Graduate School of Business' Knight Management Center, Silicon Valley Business Journal (2010)
- Best Green Building in the Bay Area, for Y2E2, San Francisco Business Times (2008)
- Leadership in Applying Green Building Design, for Stanford Dining, PG&E (2006)
- Top Ten Green Projects, for Jasper Ridge Field Station, American Institute of Architects Committee on the Environment (2005)
- Energy & Sustainability Award, for Jasper Ridge Field Station, American Institute of Architects, San Francisco Chapter (2005)

MORE INFORMATION
CONTACT
Sustainability Programs: Fahmida Ahmed, Director, fahmida@stanford.