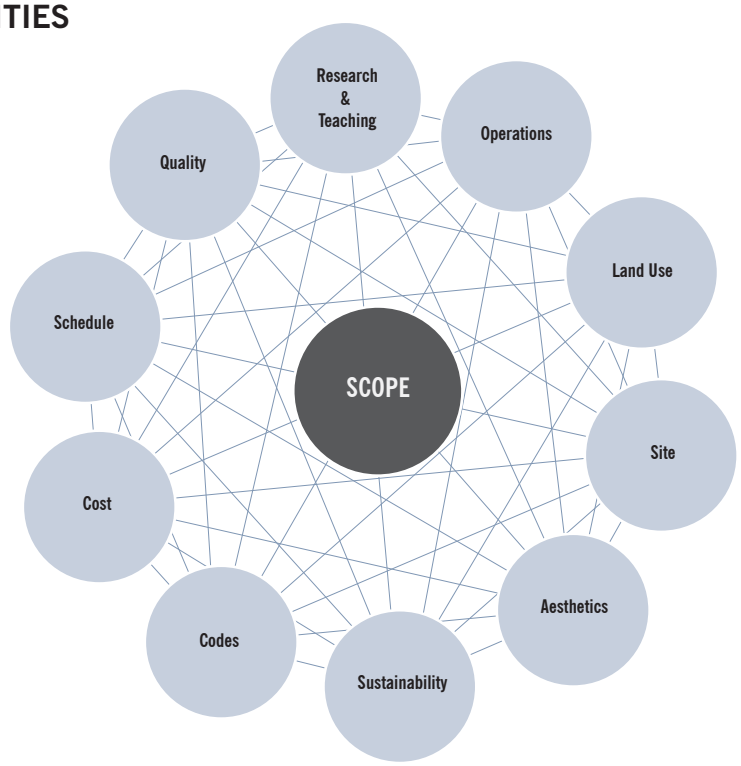
SUSTAINABLE BUILDING AT STANFORD

Stanford is committed to providing a sustainable and inspiring built environment for our students, faculty, staff, and visitors. Sustainability incorporates balanced concern for future preservation of three interdependent areas: environment, economy, and equity. 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 can be built to conserve resources and inspire users. Achieving this requires an integrated process with sustainability as a base criterion in all development stages.

The sustainability principles set out in the PDP are intended to aid in planning, design, and construction of new buildings and major renovations with balanced attention to environmental, economic, and social concerns. Stanford faces environmental, economic, and political challenges of greenhouse gas emissions reductions, water shortages, land use priorities, and rising operations and maintenance costs. Sustainability is one of many, often competing, criteria and priorities for building projects. These competing factors—such as cost, quality, schedule, and sustainability—are considered and balanced to support the program scope.

COMPETING PRIORITIES



Sustainability is one of several priorities that the project team must weigh in determining the best possible project outcome.

SITE DESIGN AND PLANNING

Sustainable site planning identifies ecological, infrastructure, and cultural characteristics of the site to better integrate buildings and landscape. Stanford encourages architectural/site planning that makes optimum use of natural features. Examples of sustainable site planning include a focus on district development, pedestrian and bike connections, building siting to reduce energy use, and enhancement of the existing environment.

ENERGY USE

Reducing energy use is central to creating a sustainable campus. While Stanford is building on a decades-long commitment to energy conservation and efficiency, and benefits from a temperate climate and strong state energy codes, the university has recognized that it is increasingly important to focus on building energy usage and monitoring. Examples include efficient building systems, effective control systems, and high-performance building envelopes.

WATER MANAGEMENT

Sustainable buildings conserve water resources with more efficient design and operating structures. Stanford practices sustainable water use by managing available resources to meet university needs while preserving ecological systems. Examples include native/drought–tolerant landscapes, the use of alternative water sources, and conservation.

MATERIALS, RESOURCES, AND WASTE

Waste is generated and transported to landfills throughout building demolition, renovation, and construction as well as throughout the life of the building. Sustainable design at all stages of building development, including plans to recycle and reuse construction waste, can help alleviate the pressure on landfills and natural resources. Examples include salvage and reuse of demolished materials, recycling and reduction of construction waste, design for recycling, and use of environmentally sensitive materials and products. The university is continually improving collection activities, identifying new markets for waste materials and recyclables, and raising awareness of opportunities for salvage, reuse, and recycling.

INDOOR ENVIRONMENTAL QUALITY

Research has shown that buildings with daylight, fresh air, and occupant controls are consistently rated as more comfortable and contribute to building occupants' performance and productivity. The benefits of pleasant indoor environmental quality extend to Stanford's students, faculty, and staff. Examples include integrating natural lighting and ventilation into building design.

SUSTAINABILITY IN THE PDP

Stanford has made responsible land use planning and natural resource conservation priorities since its founding. Starting with the Main Quad, the campus was designed and built with long-term stewardship and growth in mind. The most sustainable buildings are those that balance environment, equity, and economy. To ensure this balance, the PDP uses the following strategies throughout the process phases to allow the project team to make informed decisions regarding sustainable design:

To move toward campus sustainability goals, Stanford invests in high-performing building design and systems. The ***Guidelines for Life Cycle Cost Analysis (LCCA)*** instructs project teams to consider not only the "first costs" of a building (design and construction expenses) but also long-term costs, such as operations and maintenance. The LCCA is a method of evaluating project design decisions as they relate to total building life costs. The project team assesses the value to the project of life cycle cost (LCC) comparisons in six general categories: energy systems, mechanical systems, electrical systems, building envelope, siting/massing, and structural systems. The project team analyzes which specific studies are relevant to each project. Study results that show a favorable payback are included in the project scope.

In 2008, Stanford implemented rigorous **energy and water resource reduction goals** for all new capital projects and renovations. New and significantly renovated buildings are targeted to be 30% more energy–efficient on average than current energy codes require. Stanford buildings are targeted to use at least 25% less potable water than similar traditional buildings.

Stanford has a comprehensive program for waste reduction. Construction waste and demolition debris make up a significant amount of solid waste. Construction projects are required to address **salvage and recycling** as fundamental parts of the project's parameters. Waste minimization planning is integral to optimize recycled and salvaged material and minimize cost and schedule impacts to a project.

Commissioning is a quality-oriented process for achieving, verifying, and documenting that the performance of facilities systems meets defined objectives/criteria. Essentially, the commissioning process formalizes review and integration of all project expectations during planning, design, construction, and occupancy phases by inspection and functional performance testing, and oversight of operator training and record documentation. Stanford's commissioning process begins early in the Design phases. Stanford, along with the mechanical, electrical, and plumbing (MEP), designer/consultant, define the commissioning process and scope. The design consultant provides peer review and on–site verification of conformance with the design, working with the project team. A commissioning agent provides functional performance testing and verification prior to turnover. Active participation by various Stanford entities, such as DPM, BGM, and SEM is critical to an effective turnover of high-performing building systems.