

BEYOND ENERGY

Resource Efficiency in Materials, Space, and Water

In addition to the intensive focus on operational energy reduction, the client and design team worked intently on several other sustainability goals:

1. Loose Fit / Long Life - The organization of these buildings allows for maximum flexibility both in the near and long term. Limited internal partitions, a column-less open floor plate on the second floor, and movable lab shelving and benches allow easy reconfiguration within the building to meet the continually changing needs of the staff and their research with minimal environmental or economic impact. Building size was reduced through careful programming and assignment of storage and workshop spaces to a modestly-conditioned warehouse.

2. Carbon Emissions - Since lower carbon emissions were one of the key goals for the client, they were tracked based on embodied carbon emissions of the building materials as well as the produced carbon emissions resulting from energy use. The embodied carbon emissions were reduced by 43% primarily through the substitution of fly ash for over half of the cement in nearly 100% of the concrete. Overall, embodied carbon emissions were reduced by over 55% as compared to a baseline case.

3. Material REuse - The use of salvaged materials reduces virgin material use and adds narrative character to the project. Exterior redwood siding is salvaged from decommissioned Sebastiani vineyard wine vats. Due to the tight-grained quality of this old-growth wood no sealer or paint is necessary as a preservative, reducing first cost and maintenance over time and helping to pay for the higher quality wood. Tables in the conference room and lobby are milled down and finished from trees salvaged from a nearby municipal yard. Salvaged doors donated by the contractor form the basis for workstation tabletops. Lab casework in all support areas and faucets for all lab sinks are also salvaged. Recycled aggregate substituted for around 20% of site concrete aggregate.

4. Material Reduction - Finish materials were kept to a minimum with exposed acoustic deck ceilings, radiant integrally-colored concrete floors (ground down in the lobby to expose the aggregate), and exposed steel trusses and columns providing much of the material character.

5. Well-managed Forests - All wood in the building, including doors, new casework, trim, lightshelves and railings are FSC-certified domestic ash.

6. Water Efficiency - Water use is reduced by one-third through no-irrigation landscaping, dual flush toilets, a waterless urinal and low-flow sinks.

7. Water Management - Water issues are a key concern in this arid climate. The design team focused accordingly on limiting water use, reducing stormwater runoff to San Francisco Bay, and promoting aquifer recharge. A native oak woodland habitat - including perennial grasses, chaparral and two species of oak - is developing without the use of a permanent irrigation system. Bio-swales were constructed along three sides of the building site to slow down site runoff and encourage infiltration and aquifer recharge. Impermeable surfaces are minimized and paved areas are shaded to reduce heat island effects. 43% of precipitation is managed on site. Total water use is reduced by one-third through no-irrigation landscaping, dual flush toilets, a waterless urinal and low-flow sinks.

8. Community Design & Connection - The challenge was to create a new campus center out of what was previously a “back-of-house” area. The vertical presence of the Cool Tower serves to draw visitors into the courtyard and announce the importance of this new research center. Fronting onto this courtyard is the lobby which was conceived as a comfortable indoor/outdoor space where scientists can relax and collaborate. Large vertical bi-fold doors open up to the courtyard and landscape on two sides, allowing the space to be passively conditioned during the many months of good weather at Stanford and encouraging interaction between researchers.