Urban Land Institute San Francisco
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ULI San Francisco District Council Sustainability Committee: Best Practice Case Study

The David & Lucile Packard Foundation Building

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Location	Los Altos, CA
Size	49,161 sq ft
Building Height	2 stories
Date constructed	2012
Uses	Office, Small Data Center

Net-Zero Success: Form and Function

The David and Lucile Packard Foundation has joined a group of only about two dozen Net-Zero energy buildings in the country, and one of only a handful pursuing certification by the International Future Living Institute (expected Fall 2013). The building has also earned a Platinum Certification from Leadership in Energy and Environmental Design (LEED). The Foundation's headquarters brings all of the technological and structural features that can save energy together with a beautiful and functional design, to create a workspace that is good for the planet and good for the employees.

A conventional office building plan was pulled apart to form two day lit office bars united by a landscaped courtyard and "bridge connectors". The building contains spaces for meetings, common use, and individual work. With simple, natural accents throughout, the result is a highly-efficient and inviting work environment. The overall project was managed by Rhodes/Dahl, a company based in Charlestown, South Carolina. The lead architect is EHDD Architecture, a nationally recognized San Francisco–based firm that designed the Monterey Bay Aquarium, and a leader in the design and construction of sustainable buildings. The firm responsible for construction is DPR Construction; and finally, Integral Group took the lead on design of the mechanical systems.

Drivers for sustainability achievement

The Packard Foundation was committed to designing a new building that was inviting, attractive, and understated—a building that reflects the values of the Foundation and the Los Altos community. The building supports the revitalization of a highly visible gateway to downtown Los Altos, while maintaining a look that is in harmony with the existing architectural style of the neighborhood. Also, the project demonstrates that it is not necessary to choose between comfort and sustainability when investing in a new building.

By undertaking this project, the Packard Foundation is living its mission–one that focuses on conserving resources, protecting the planet and improving the lives of all people. It also aligns the Foundation closer with the important work its grantees do every day. One goal of the project was to demonstrate a replicable path to developing Net Zero Energy office buildings. The project has intentionally gone beyond what might be typical, in an effort to learn what might be possible.

Economic successes

Because the building is owned and occupied by a nonprofit organization committed to sustainability, economic feasibility was not the only factor considered. Nevertheless, there are still economic lessons to be learned from the construction of this facility. For example, one goal was the capability to replicate the building easily for others. Among builders and developers, a common term is “replicable shell”. In the case of the Packard Foundation Building, the costs of a replicable shell were about $477 per square foot. This includes the roof, walls, windows, heating, cooling, plumbing, elevator, and solar panels. It is anticipated that this replicable shell would attain LEED certification in most climates and also achieve Net Zero in similar climates.

To be clear, the Foundation added to this “replicable shell” a variety of tenant improvements, including Packard-specific external and interior local finishes, as well as site-specific preparations that increased project costs to $756 per square foot. For example, the foundation used fallen or extracted eucalyptus trees from the Presidio in San Francisco to build beautiful, custom office doors. This is an excellent use of local and natural resources, but not necessarily an inexpensive one. These above-standard improvements were at the discretion of the Foundation and greater than what is typically necessary for LEED certification alone, but a useful data point for future Net Zero efforts. Furthermore, over time, it is anticipated that the data collected from building operations will be utilized to establish standards for future sustainable and Net Zero buildings. More cost-effective methods will evolve as what is innovative today becomes the standard for tomorrow.

Financing

The Foundation utilized its own resources to finance the project.

Innovative energy features

The building contains several innovative energy features, including:

- Individual dashboards on employee computer desktops that allow energy usage from equipment such as charging devices and printers to be monitored in real time. The dashboards also include an icon that appears on all monitors throughout the office, suggesting appropriate times for the use of operable windows.
- Chilled beam construction with external water storage, which allows external air typical to the climate almost year round to cool the water at night at no cost, then the water efficiently cools the building during the day. The cycle is repeated the following night.
- A highly insulated building envelope, including triple-element glazing (R-7.7) and continuously insulated wood-framed wall (R-24). This eliminates the need for perimeter heating.
- Landscaping comprised of 90% California native and/or local vegetation. This minimizes irrigation and toxic chemicals required by non-native species.
- Rain gardens that capture and filter runoff before it enters the storm drains and ultimately the ocean.
- Collection of roof run-off for use in toilet flushing and irrigation.
- Innovative gutters, toilets and irrigation systems that reduce water usage by up to 40% compared to typical fixtures and systems.
- An aggressive plug load reduction plan that reduces expected plug loads by 50%.
- Occupancy and lighting level sensors deployed throughout the building and site.
- Solar panels which offset 100% of the remaining building's energy consumption.

Innovative materials features

The Foundation sourced as many materials as possible within 500 miles from the site, per LEED standards. At the same time, simple, natural finishes were utilized throughout the building. Innovative and sustainable approaches to materials include:

- Deconstruction recycling or reuse of approximately 95% of the materials from the previous buildings on site. The Foundation understood that debris from demolition is typically one of the larger contributors to landfill waste and wanted to reduce this impact.
- Use of a durable, rocking steel frame.
- Exclusive use of Forest Stewardship Council certified (FSC) wood.
- Installation of what would have been waste end cut pieces in the floors. Not only does this save waste, but these short cut pieces set on end create a beautiful mosaic, natural, and very durable floor.
- Utilization of recycled copper (75%).
- Re-use of recently removed, non-native eucalyptus trees from the nearby Presidio Park in San Francisco to make office doors throughout the facility.

The green roof contains a variety of shallow rooting, low growing succulents which create a mosaic similar to the bluffs on the California coast. Underneath the plants is a gridded drip irrigation system. Solar panels cover the guest parking as well as the roof management system.

Access / mobility

The Foundation incorporated universal design features throughout. Presently designed to accommodate 120 employees over nearly 50,000 square feet (417 square feet per employee), there is accommodation made for ADA access. With additional efforts to decrease air travel, more work is conducted via video conference, further increasing access for all.

Yet, one of the better success stories of the project involves commuting. Commuting (and transportation in general) was determined to be the single largest source of carbon emissions. The design team worked with the client to analyze actual parking demand and develop a Transportation Demand Management Plan. Eventually, this allowed the elimination of a planned underground garage from the project, saving $8 million and an estimated 25% of embodied carbon emissions. Alternative and innovative methods of commuting were also implemented bike racks, buses to public stations, and a paid-for taxi service for employees as needed for family emergencies.

The use of natural light enhances building energy performance. Blinds and shades are incorporated into the building design to prevent unwanted solar heat gain, control glare on work surfaces, and are controlled by the building management system.

Measured performance data

Data from the building is being collected and analyzed. The ultimate intent is to share meaningful, aggregated data and lessons learned regarding building operations and energy usage. One of the most important actions undertaken by the operations staff at the facility was to develop a smart metering plan at the outset of the project in order to track energy usage and savings. As part of this effort, an impartial third party metering expert is being utilized to verify and validate data, in addition to the meter readings by the utility and the staff onsite.

Environmental certification

The Packard Foundation Building earned LEED Platinum certification. It is also pursuing certification by the International Living Future Institute as a Net Zero Energy building.

Andrew Northrop, ULI San Francisco, with special thanks to EHDD
FOR MORE INFORMATION: http://www.packard.org/