The David & Lucile Packard Foundation Headquarters

LOS ALTOS, CALIFORNIA

Project Narrative

The headquarters for The David and Lucile Packard Foundation in Los Altos, California brings staff, grantees and partners together to solve the world's most intractable problems. For two decades, as the Foundation's grant-making programs expanded locally and internationally, staff and operations have been scattered in various buildings--this project brings them together in one primary location to enhance collaboration on their many projects. Their prior facilities were primarily large private offices that included meeting space within each office which limited collaboration. The new design has half the staff in open workstations, and half in small private offices, supported by a diverse range of shared communal meeting and social spaces.

Sustainable Design

The project's focus on sustainability reflects the Foundation's core work of conserving and restoring the Earth's natural systems. Their new home – the largest building to date to receive Net Zero Energy Building Certification™ through the International Living Future Institute – is the cornerstone of their effort to demonstrate how they can improve the effectiveness and the quality of life for its employees while meeting aggressive carbon reduction goals as an organization.

The project vision was not to design a sustainable building, but to advance the Foundation's sustainability as an organization. We believe in a fundamentally shift to broaden the approach to sustainability beyond the building to include the organization as a whole, and to assist our clients in achieving these larger goals. Our integrated design team, including transportation planners, sustainable food experts and a newly formed client Sustainable Task Force, began with an assessment of the Foundation's overall GHG inventory. Staff commuting, travel and building energy use each represented about a third of their emissions. We then developed strategies to address each of these sectors, to reduce their entire carbon footprint by 80% by 2050. Getting their building to zero energy was the key first step in this journey, reducing overall emissions by 35%.

The emissions associated with Commuting were addressed through a comprehensive transportation demand management program. With this plan in hand, we were able to negotiate a reduction in on-site parking from the 160 spaces per the planning code, to just 67 spaces. This allowed us to eliminate an $8 million underground parking garage, cut the building's embodied energy in half, and create a superior courtyard with mature trees and landscaping since they were no longer planted over structure. Extensive video conferencing capabilities were included to support the Foundations commitment to reduce air travel by 10% in the next two years.

Occupant Survey Results

In response to prior lessons learned as our buildings are occupied and we conduct post occupancy surveys, we are now explicitly including an additional phase of work (and fee) for 1 year after occupancy. This allows the full design team to respond to issues that come up in the energy monitoring and occupant survey results. There were a number of results we discovered in the CBE survey that we were then able to address.

Some of the occupants reported glare problems in certain offices and a number of these were attributed to the automatic exterior blinds not being calibrated correctly, these were then reprogrammed to the correct times. There was also a thin shaft of daylight that "leaked" between the window frame and the blind which we were able to remedy with the addition of a continuous angle. Some occupants expressed a lack of adequate daylight in their space, our sense is that these first floor workers would be fine in a typical office, but compared to the exceptionally bright and even daylighting on the second floor, they don't feel they have "daylight parity." The most significant failure with the building when it opened was the complete mechanical failure of two of the four Multi-stack heat pumps that provided heating. This left the building with inadequate heating in the winter of 2013 prior to the survey. It would be interesting to survey again on the issue and see if complaints of cold hands were reduced.

Several acoustic issues were raised in the survey, in particular the staff entrance was much more heavily used than anticipated, disturbing adjacent workstations. We have since separated that entry from the workstations with a glazed partition to mitigate this issue. There were also complaints about speech privacy and noise in the workstations, reflecting a challenging transition from private to open offices for some staff.

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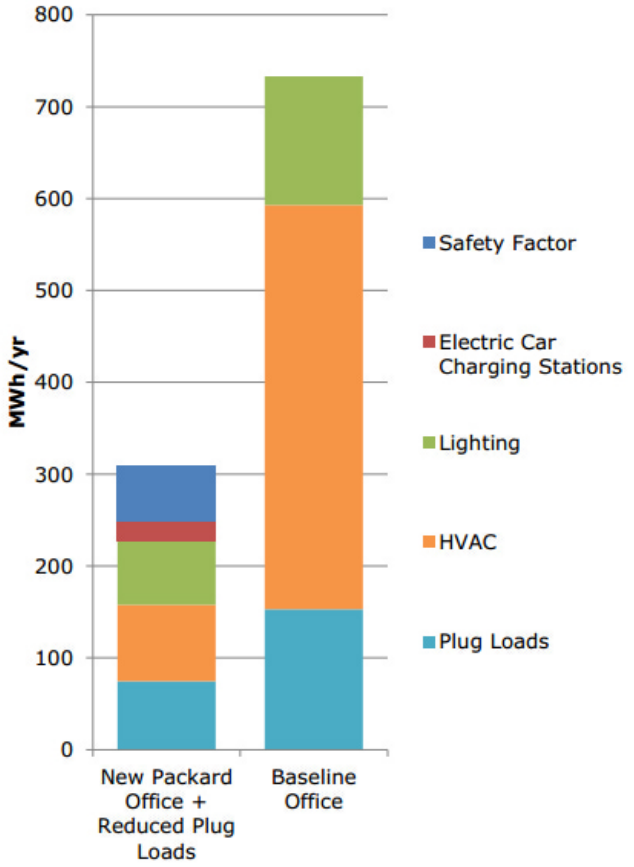
Energy Performance Data

We have very detailed measured performance data for the first year and the building reached its zero energy goal a couple of months early. Second year performance is trending significantly better yet. The measured lighting loads were quite a bit lower than predicted, due to very successful daylighting, very successful commissioning, and an explicit first year post occupancy phase to optimize performance that included the entire design team. Heating loads were higher than modeled, cooling loads were significantly lower than predicted. We expect to complete a white paper detailing the results after year two.

The team completed a detailed plug load study to quantify their existing plug loads, and developed recommendations for purchasing and power management that predicted a 58% reduction in these loads. Detailed measured data shows plug loads came in significantly below this reduced target. This was due in part to quickly falling power demand for computing due to solid state drives and the shift to low power chips developed for phones and tablets.

The building design was fundamentally shaped by the desire for a thin floor plate for excellent daylighting and natural ventilation. A great deal of attention was paid to shading, including fixed and operable controlled exterior blinds. The building envelope included exterior insulation, wood studs and extensive detailing to minimize thermal breaks, and air sealing to reduce infiltration. An unexpected discovery was that triple element glazing reduced the initial cost of construction by allowing the elimination of 4 pipe perimeter heating/cooling elements. The building includes a 258 kw PV system that also serves several car charging stations as part of our effort to reduce transportation emissions. The PV cost dropped significantly from first design cost estimates to final installed price as the cost of panels fell sharply.

Total EUI: 22kBtu/sf/yr
Net EUI: -4kBtu/sf/yr
Percent Reduction from National Median EUI for Building Type: 76%
Lighting Power Density: 0.60watts/sf



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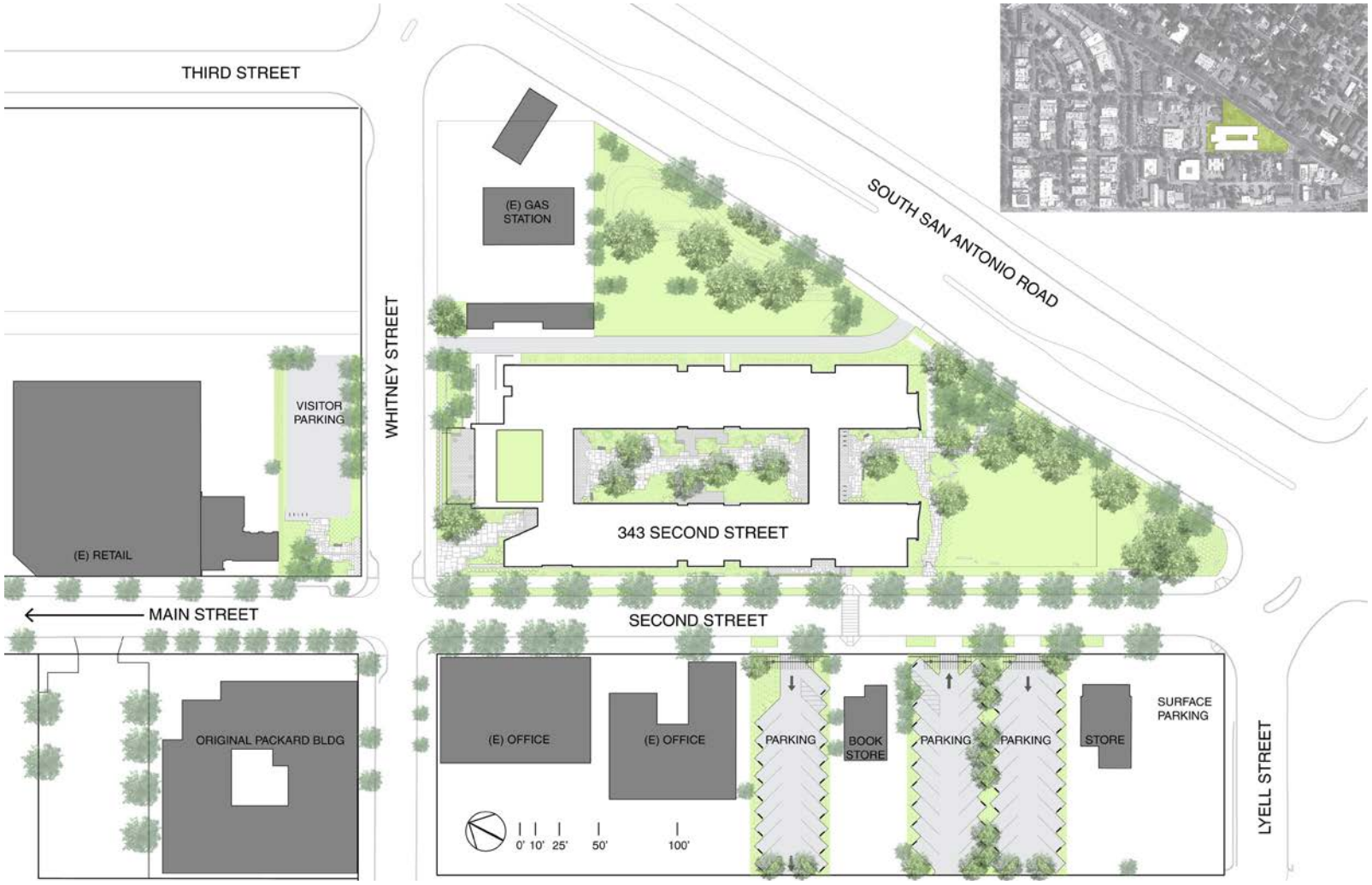

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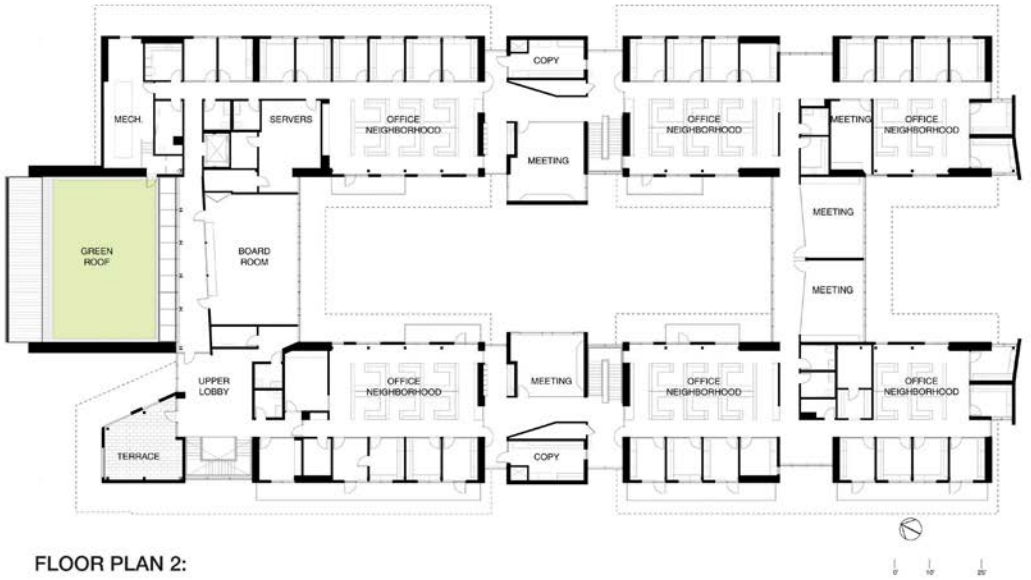

FLOOR PLAN 2:

FLOOR PLAN 1:

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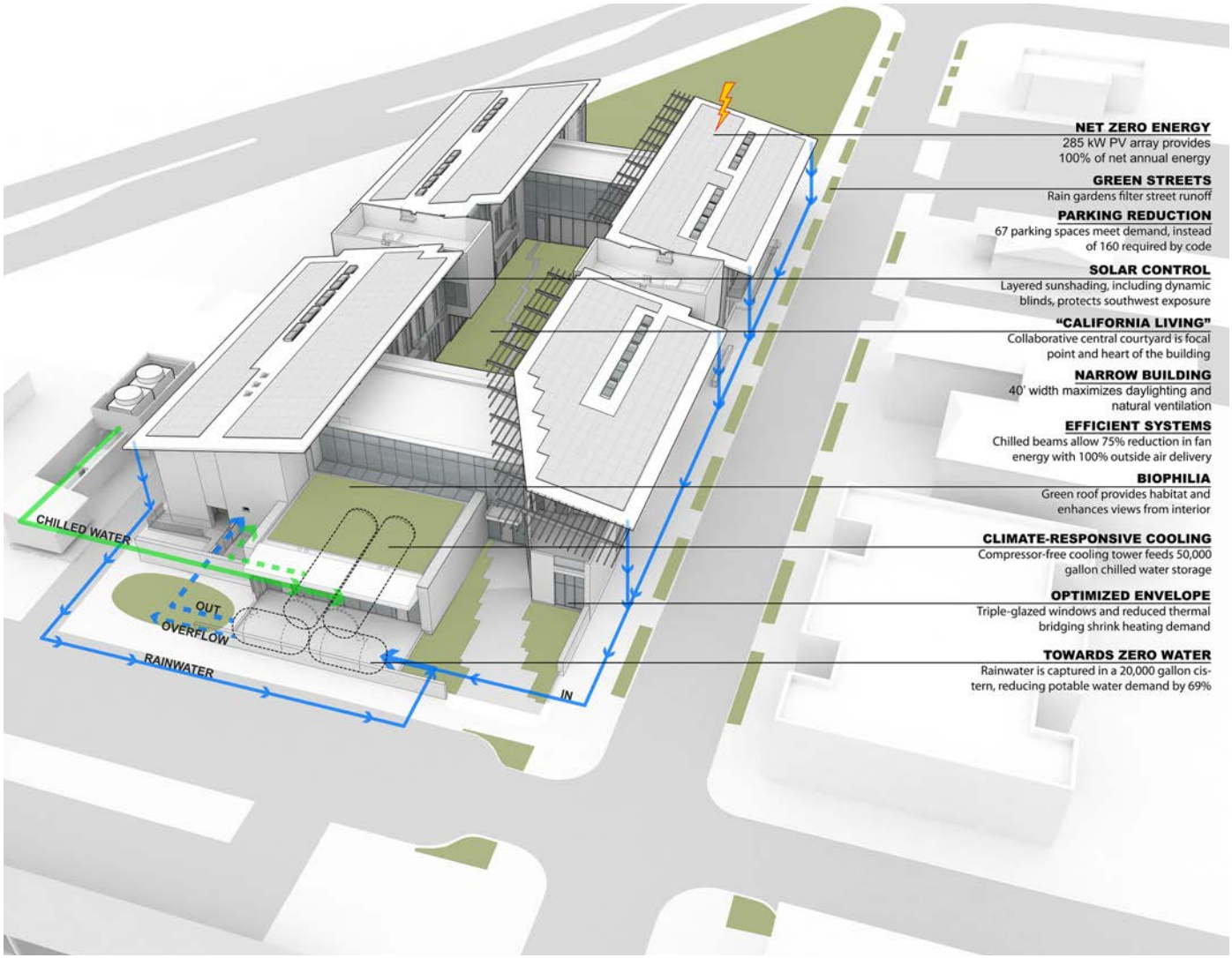

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LEED Certification Review Report

This report contains the results of the technical review of an application for LEED® certification submitted for the specified project. LEED certification is an official recognition that a project complies with the requirements prescribed within the LEED rating systems as created and maintained by the U.S. Green Building Council® (USGBC®). The LEED certifcation program is administered by the Green Building Certification Institute (GBCI®).

Packard Foundation 343 Second St Project

Project ID	1000004074
Rating system & version	LEED-NC v2009
Project registration date	01/08/2010

Certified (Platinum)

CERTIFIED: 40-49, SILVER: 50-59, GOLD: 60-79, PLATINUM: 80+

LEED FOR NEW CONSTRUCTION & MAJOR RENOVATIONS (V2009)

ATTEMPTED: 95, DENIED: 0, PENDING: 0, AWARDED: 94 OF 110 POINTS

SUSTAINABLE SITES	24 OF 26
SSp1 Construction Activity Pollution Prevention	Y
SSc1 Site Selection	1 / 1
SSc2 Development Density and Community Connectivity	5 / 5
SSc3 Brownfield Redevelopment	0 / 1
SSc4.1 Alternative Transportation-Public Transportation Access	6 / 6
SSc4.2 Alternative Transportation-Bicycle Storage and Changing Rooms	1 / 1
SSc4.3 Alternative Transportation-Low-Emitting and Fuel-Efficient Vehicles	3 / 3
SSc4.4 Alternative Transportation-Parking Capacity	2 / 2
SSc5.1 Site Development-Protect or Restore Habitat	1 / 1
SSc5.2 Site Development-Maximize Open Space	1 / 1
SSc6.1 Stormwater Design-Quantity Control	1 / 1
SSc6.2 Stormwater Design-Quality Control	1 / 1
SSc7.1 Heat Island Effect, Non-Roof	0 / 1
SSc7.2 Heat Island Effect-Roof	1 / 1
SSc8 Light Pollution Reduction	1 / 1

WATER EFFICIENCY	8 OF 10
WEp1 Water Use Reduction-20% Reduction	Y
WEc1 Water Efficient Landscaping	2 / 4
WEc2 Innovative Wastewater Technologies	2 / 2
WEc3 Water Use Reduction	4 / 4

ENERGY AND ATMOSPHERE	33 OF 35
EAp1 Fundamental Commissioning of the Building Energy Systems	Y
EAp2 Minimum Energy Performance	Y
EAp3 Fundamental Refrigerant Mgmt	Y
EAc1 Optimize Energy Performance	19 / 19
EAc2 On-Site Renewable Energy	7 / 7
EAc3 Enhanced Commissioning	2 / 2
EAc4 Enhanced Refrigerant Mgmt	2 / 2
EAc5 Measurement and Verification	3 / 3
EAc6 Green Power	0 / 2

MATERIALS AND RESOURCES	6 OF 14
MRp1 Storage and Collection of Recyclables	Y
MRc1.1 Building Reuse-Maintain Existing Walls, Floors and Roof	0 / 3
MRc1.2 Building Reuse, Maintain 50% of Interior	0 / 1
MRc2 Construction Waste Mgmt	2 / 2
MRc3 Materials Reuse	0 / 2
MRc4 Recycled Content	2 / 2

MATERIALS AND RESOURCES	CONTINUED
MRc5 Regional Materials	1 / 2
MRc6 Rapidly Renewable Materials	0 / 1
MRc7 Certified Wood	1 / 1

INDOOR ENVIRONMENTAL QUALITY	13 OF 15
IEQp1 Minimum IAQ Performance	Y
IEQp2 Environmental Tobacco Smoke (ETS) Control	Y
IEQc1 Outdoor Air Delivery Monitoring	1 / 1
IEQc2 Increased Ventilation	1 / 1
IEQc3.1 Construction IAQ Mgmt Plan-During Construction	1 / 1
IEQc3.2 Construction IAQ Mgmt Plan-Before Occupancy	0 / 1
IEQc4.1 Low-Emitting Materials-Adhesives and Sealants	1 / 1
IEQc4.2 Low-Emitting Materials-Paints and Coatings	1 / 1
IEQc4.3 Low-Emitting Materials-Flooring Systems	1 / 1
IEQc4.4 Low-Emitting Materials-Composite Wood and Agrifiber Products	1 / 1
IEQc5 Indoor Chemical and Pollutant Source Control	0 / 1
IEQc6.1 Controllability of Systems-Lighting	1 / 1
IEQc6.2 Controllability of Systems-Thermal Comfort	1 / 1
IEQc7.1 Thermal Comfort-Design	1 / 1
IEQc7.2 Thermal Comfort-Verification	1 / 1
IEQc8.1 Daylight and Views-Daylight	1 / 1
IEQc8.2 Daylight and Views-Views	1 / 1

INNOVATION IN DESIGN	6 OF 6
IDc1.1 Innovation in Design	1 / 1
IDc1.2 Innovation in Design	1 / 1
IDc1.3 Innovation in Design	1 / 1
IDc1.4 Innovation in Design	1 / 1
IDc1.5 Innovation in Design	1 / 1
IDc2 LEED® Accredited Professional	1 / 1

REGIONAL PRIORITY CREDITS	4 OF 4
SSc4.1 Alternative Transportation-Public Transportation Access	1 / 1
SSc7.1 Heat Island Effect, Non-Roof	0 / 1
WEc2 Innovative Wastewater Technologies	1 / 1
WEc3 Water Use Reduction	1 / 1
EAc2 On-Site Renewable Energy	1 / 1
IEQc8.1 Daylight and Views-Daylight	0 / 1

TOTAL	94 OF 110

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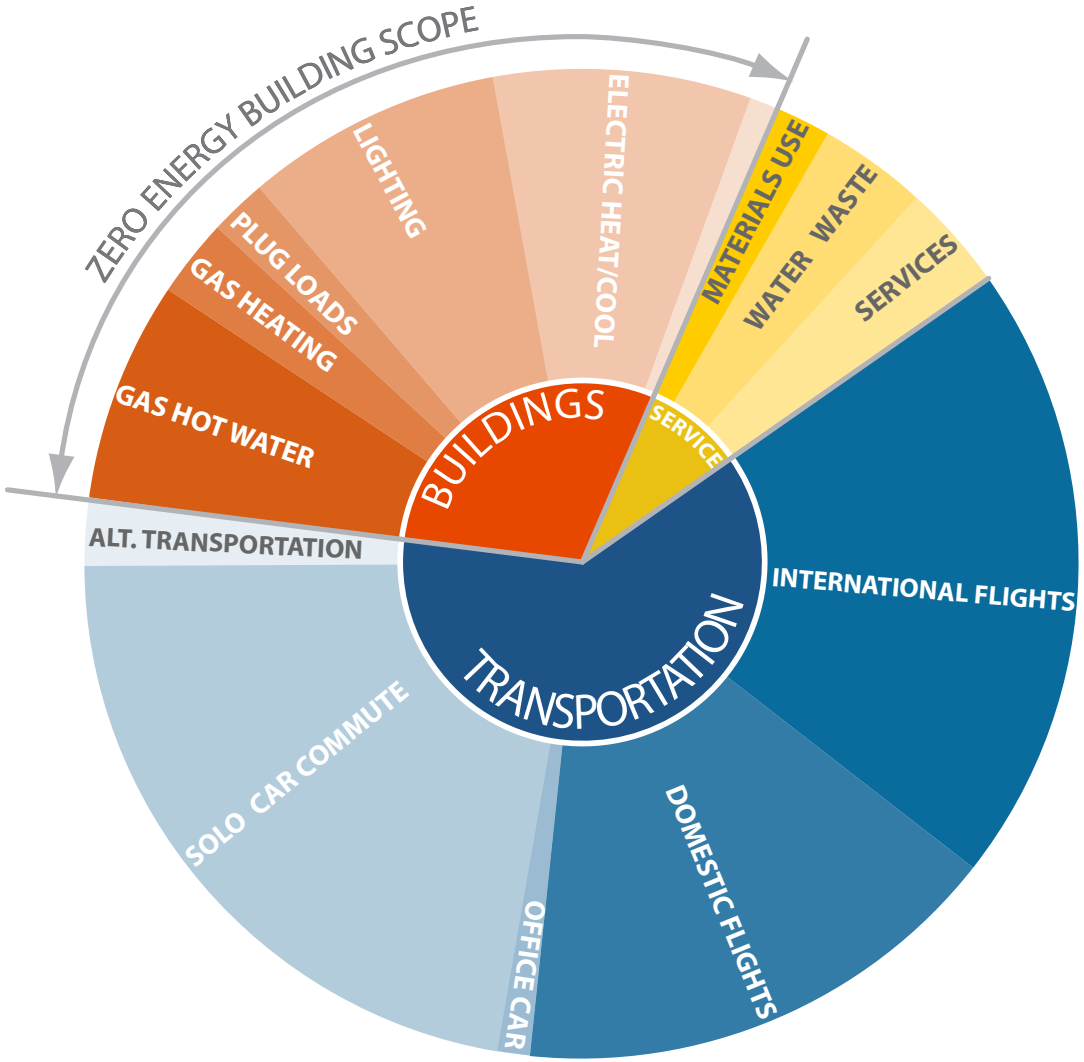

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SECTION A

1. 285 kW PV array results in net positive energy balance
2. $8 million parking garage eliminated through TDMP
3. Captured rainwater for toilet flushing and irrigation
4. 40' width maximizes daylighting and natural ventilation
5. Dynamic exterior blinds lower with direct sun
6. Plug loads reduced by over 60%
7. Triple-glazed, R-8 windows reduce heating system
8. Exposed FSC certified wood structure
9. Chilled beams with 100% fresh air
10. "Green Streets" strategies increase site perviousness by 62%

SECTION B

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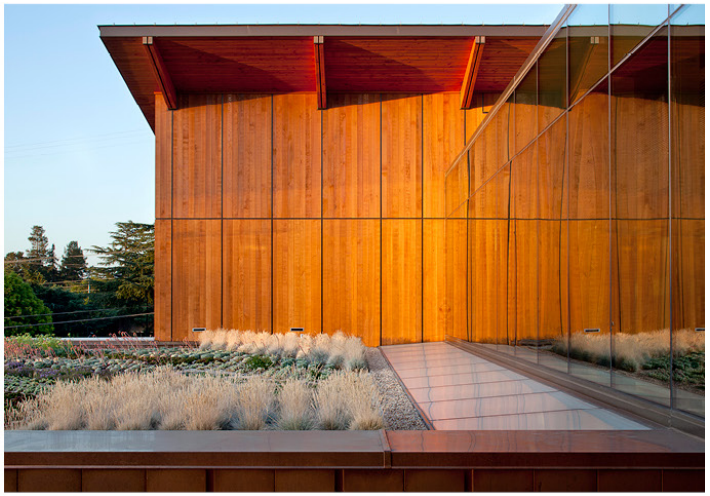

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Project Team

Architect of Record: EHDD Architecture

Owner's Representative: Rhodes Dahl

General Contractor: DPR Construction

Structural: Tipping Mar

Mechanical, Electrical & Plumbing: Integral Group

Civil: Sherwood Design Engineers

Acoustics: Charles M. Salter Associates

Commissioning Agent: CTG Energetics – The CADMUS Group

Landscape: Joni L. Janecki & Associates

Lighting: Janet Nolan & Associates

Daylighting: Loisos Ubbelohde

Photo Credit

Jeremy Bittermann
David Livingston