

¹ SUMMIT AT CALABASAS

LOCAL BENEFITS

- Construction erosion control
- Non-endangered species habitat land use
- Provisions for public transportation and pollution-free transportation
- Minimized impact on local air temperature due to solar interaction of installed materials
- Minimized light pollution
- Indoor air quality exceeds conventional quality standards
- Incorporation of low/non-toxic materials
- Thermal interior comfort control exceeds conventional standards
- Selection of high quality, durable products for longevity and low-maintenance operation
- Patron comfort and employee productivity increased due to good design including natural lighting, views, public access, and selection of healthful components and systems. Sets working example for future retail projects.

REGIONAL & GLOBAL BENEFITS

- Facility to provide multi-media, multi-faceted sustainable education resources
- Minimized impact on stormwater runoff volume
- Minimized pollution from stormwater runoff
- Recharge contribution to aquifer
- Water consumption greatly reduced over conventional standards
- Energy performance exceeds California State standards
- Utilization of renewable power sources
- Reduction of greenhouse gas emissions
- Reduction of construction waste
- Incorporation of high recycled-content materials
- Incorporation of regionally manufactured products
- Large percentage of wood-based products incorporating sustainably harvested wood
- Conservation of existing mature trees and increased quantity of planted trees overall
- Incorporation of native, drought-resistant plants, less dependent on irrigation and pesticides

2 U.S. GREEN BUILDING COUNCIL

The built environment has a profound impact on our natural environment, economy, health and productivity.

In the United States, buildings account for:

- 36% of total energy use/65% of electricity consumption
- 30% of greenhouse gas emissions
- 30% of raw materials use
- 30% of waste output/136 million tons annually
- 12% of potable water consumption

Breakthroughs in building science, technology and operations are available to designers, builders and owners who want to build green and maximize both economic and environmental performance.

Environmental benefits:

- Enhance and protect ecosystems and biodiversity
- Improve air and water quality
- Reduce solid waste
- Conserve natural resources

Economic benefits:

- Reduce operating costs
- Enhance asset value and profits
- Improve employee productivity and satisfaction
- Optimize life-cycle economic performance

Health and community benefits:

- Improve air, thermal and acoustic environments
- Enhance occupant comfort and health
- Minimize strain on local infrastructure
- Contribute to overall quality of life

3 NATIONAL TRENDS FOR HIGH-PERFORMANCE GREEN BUILDINGS

CONVENTIONAL INDOOR AIR QUALITY

- Air pollution concentrations indoors can be 2 to 5 times higher than the air we breathe outside, with some measurements 100 times greater
- An investigation of 20 studies with 30k subjects found significant associations between low ventilation rates and higher carbon dioxide concentrations where sick building syndrome symptoms were prevalent.
- A Lawrence Berkeley National Laboratory study (2000) found that building characteristics and indoor environments significantly influence the occurrence of communicable respiratory illness, allergy, and asthma symptoms, sick building symptoms, and worker performance.
- This same study estimated the potential national savings from health and productivity would fall between \$23 and \$56 billion.

NATURAL LIGHTING

- In a study of the test scores of 21k students in CA, math scores were 20% higher and reading scores were 26% higher for students testing under conditions of the most natural light as opposed to the least.
- Students of six schools in NC over 2 years were healthier and averaged 3-4 fewer absences when schools have full-spectrum light as opposed to conventionally lit classrooms.

WORKER PRODUCTIVITY

- S. Richard Fedrizzi, president and CEO of the U.S. Green Building Council, says office worker productivity on average increases 2 to 16 percent in green buildings.
- Another study examined sales levels in 108 nearly identical retail stores, of which some incorporated skylights and others did not; results showed 40% higher sales in daylight retail environments.

⁴ **PACKARD FOUNDATION STUDY 2002**

	Market Building (Conventional)	LEED Silver	Percentage Difference
• Office Downtown Los Altos, CA	90ksf	90ksf	
• Employees	300	300	
• Below grade parking	1.5ksf	1.5ksf	
• Life expectancy	40 yr.	60 yr.	150%
• Construction	\$10 M	\$11.3 M	113%
• Design	\$1.3 M	\$1.5 M	115%
• 30-year NPV (net present value) of total hard & soft costs	\$22.7 M	\$19.7 M	87%
• Design schedule	12 mo.	15 mo.	125%
• Construction Sched.	13 mo.	15 mo.	115%
• Total schedule	22 mo.	27 mo.	123%
• Pollution cost to Society (20-yr.) SO ₂ , CO ₂ , NO ₂ , PM ₁₀	\$3.17 M	\$1.96 M	62%
• Energy use (MMBTU/sf/yr)	10,450	6,560	63%

5 Environmental and Economic Impacts of Traditional Building

Economics of Green Buildings

Financial Benefits of Green Buildings Summary of Findings (per square foot)(11)	
Category	20-Year Net Present Value
Energy Savings	\$5.80
Emissions Savings	\$1.20
Water Savings	\$.50
Operations and Maintenance Savings	\$8.50
Productivity and Health Benefits	\$36.90 to 55.30
Subtotal	\$52.90 to 71.30
Average Extra Cost of Building Green	(-\$3.00 to -\$5.00)
Total 20-Year Net Benefit	\$\$50 to \$65

Occupant Productivity

Two studies, conducted by the Heschong Mahone Group in Sacramento, California, demonstrated that incorporation of natural light had positive results on a building's occupants. One study analyzed test score results for over 21,000 students from three elementary school districts in California, Colorado, and Washington State. Results from the Capistrano Unified School District in Orange County, California, indicated that, in one year, students with the most daylighting in their classrooms progressed 20% faster on math tests and 26% on reading tests. Another study examined sales levels in 108 nearly identical retail stores, of which some incorporated skylights and others did not; results showed 40% higher sales in daylight retail environments.

A report by the U.S. Department of Energy and the Rocky Mountain Institute documents eight case studies, in which efficient lighting, heating, and cooling measurably increased worker productivity, decreased absenteeism, and/or improved the quality of work performed.

The Lockheed Building 157 in Sunnyvale, California, was designed to be a highly energy-efficient facility. Green design elements added \$2 million in design and construction costs to the \$50 million, 600,000-square-foot project. The use of daylighting has resulted in a 75% decrease in electricity costs, at a calculated savings of \$500,000 annually. In addition, Lockheed reports a 15% rise in production and a 15% decrease in absenteeism.

The West Bend Mutual Insurance Company in West Bend, Wisconsin, incorporated daylighting and personal, localized controls for lighting and temperature into its 150,000-square-foot office building. The costs took only 18 months to recoup, and the company saw a 16% increase in worker productivity.

REFERENCES

1. The Summit at Calabasas per City of Calabasas LEED Guidelines.
2. U.S. Green Building Council, Why Build Green? 2007,
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=291&>
3. National Trends and Prospects for High Performance Green Buildings, USGBC, 2002,
http://www.usgbc.org/Docs/Resources/043003_hpqb_whitepaper.pdf
4. Building for Sustainability Report, Packard Foundation, 2002,
<http://www.hpsarch.com/careers/2002-Matrix.pdf>
5. Environmental and Economic Impacts of Traditional Building, 2004,
<http://www.serconline.org/grBldg/fact.html>