



# FACT SHEET

## DAYLIGHTING

### DEFINITIONS

*Daylight factor, n.* the ratio of interior visible light on a given point to the exterior visible light under the same overcast sky conditions.

### LEED

#### EA CREDIT 1

Optimize Energy Performance  
1-10 points

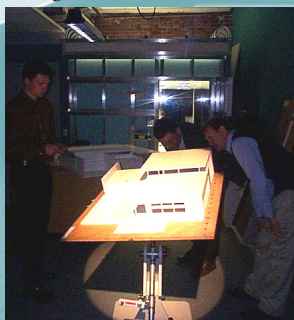
#### EQ CREDIT 8.1

Daylight & Views (Daylit Space)

#### EQ CREDIT 8.2

Daylight & Views (Views)

Daylighting study with Heliodon at one of the BetterBricks Integrated Design Labs.



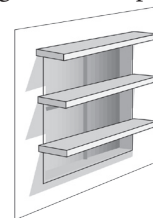
**PROPER DAYLIGHTING** is critical to high performance building design. Improper daylighting very simply creates undesirable space and lost opportunity for energy cost savings. Why is daylighting so important? Because human health is very valuable and people respond, concentrate, and think better with diffuse, full-spectrum light provided by the sun, 100% naturally and 100% free. Daylighting requires planning and careful design to avoid pitfalls such as glare, inefficient envelope, and noise impacts. When early building design charrettes plan for daylighting strategies, buildings are more energy efficient and its occupants are far healthier.

### PROCESS

Daylight can be brought into a space in a variety of ways:

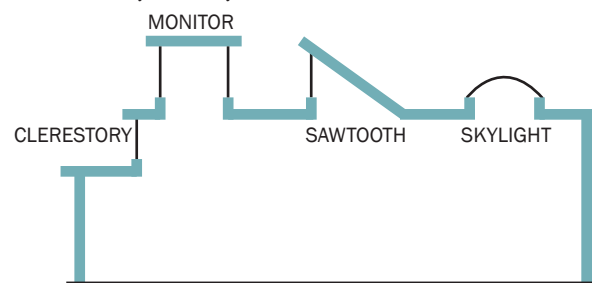


Vertical louvers, or fins



Overhang: Use on Window Interior as Light Shelf

EXAMPLES OF SIDELIGHTING STRATEGIES



EXAMPLES OF TOPLIGHTING STRATEGIES

### DESIGN CONSIDERATIONS

Daylighting strategies can be integrated through appropriate design to meet any project budget. Schools usually have low fixed budgets, but several examples show that with proper design for daylighting, electricity demand and cooling loads decrease, consequently reducing the capital and operating costs of mechanical systems.

- Building orientation: maximize northern and southern exposure for optimal daylighting potential.
- Glazing: select for high visual light transmittance without increasing heat gain.
- Shades: design to prevent glare and reflect daylight deeper into building space.
- Integrated electric lighting: ensure appropriate dimming controls; account for electric and cooling load reductions.
- Interior materials: select finishes and colors to maximize surface reflectance.

## ADDED VALUE

Proper daylighting is a valuable asset in nearly every building type. Below are some reasons why daylighting should be integral to your project:

- Increased sales, large retail chain reported 40% increase in sales due to daylighting.
- Increased productivity, employees perform better in daylit space.
- Decreased energy costs, up to 60% of energy used to electrically light a building can be saved with daylighting. Also reduces heat gain, lowering cost of cooling/HVAC.
- Improved student performance: in a study of North Carolina schools, students in daylit schools outperformed students in non-daylit schools by *at least* 5% (*Nicklas and Bailey, 1996 – Analysis of Student Performance in Daylit Schools*).

## CASE STUDY

### PIERCE COUNTY ENVIRONMENTAL SERVICES BUILDING

The Pierce County Environmental Services Building is located on the Chambers Creek Properties, a site of over 900 acres that is adjacent to the Puget Sound. Pierce County recently completed a 50-year Master Plan of the site that will guide future development. This site is intended to demonstrate the value of natural resources to the public, both in site management and building design. To this end, one of the primary design goals for the building was to create an inviting work environment with opportunities for the public to learn about better building design techniques. Proximity of all work stations to windows and views

outdoors and providing abundant natural light throughout the interior are strategies the design team used to create a better work environment. Daylighting studies measured the performance of early design phase models and led to the use of baffles in the skylights, a large western overhang, and exterior sunscreens on the eastern facade to avoid direct sunlight penetration while keeping the desired connection to natural light. The general public is welcome to visit the building's interpretive exhibit program and learn about the mission of the organization, the history of the site, and the implementation of the 50-year Master Plan.



## RESOURCES

THE FOLLOWING RESOURCES SERVE AS A STARTING POINT FOR A LARGE QUANTITY OF AVAILABLE INFORMATION:

WHOLE BUILDING DESIGN GUIDE  
[www.wbdg.org/design/daylighting.php](http://www.wbdg.org/design/daylighting.php)

PORTLAND G/RATED PROGRAM  
[www.green-rated.org/resctr\\_tech.asp?id=2](http://www.green-rated.org/resctr_tech.asp?id=2)

BETTERBRICKS INTEGRATED DESIGN LAB NETWORK  
[www.betterbricks.com/default.aspx?pid=lightinglabs](http://www.betterbricks.com/default.aspx?pid=lightinglabs)

INSTITUTE FOR RESEARCH IN CONSTRUCTION  
[http://irc.nrc-cnrc.gc.ca/ie/lighting/daylight/index\\_e.html](http://irc.nrc-cnrc.gc.ca/ie/lighting/daylight/index_e.html)

SEATTLE CITY LIGHT  
[www.cityofseattle.net/light/conserve/sustainability/studies/cv5\\_sp.htm](http://www.cityofseattle.net/light/conserve/sustainability/studies/cv5_sp.htm)

FOR MORE INFORMATION ON THIS TOPIC AND OTHERS, VISIT  
[www.cascadiagbc.org](http://www.cascadiagbc.org)

Location: University Place, Washington  
Building Size: 50,000 sq ft (two stories)  
Intended Use: Commercial office space, public agency

Photos courtesy of: The Miller/Hull Partnership  
Photographer: Eckert & Eckert



## A ROADMAP FOR SUSTAINABLE BUILDING

