



*LEED Silver Certification:  
Lillis Business Complex,  
University of Oregon*

# LEED<sup>®</sup> 2009

## and Sunoptics Prismatic Skylights



# SUNOPTICS<sup>®</sup>

High Performance Prismatic Daylighting

An **Acuity** Brands Company

Because... There's No Greater Efficiency Than Off!<sup>®</sup>

# LEED® 2009 and Sunoptics Prismatic Skylights

LEED® is an acronym for the phrase *Leadership in Energy and Environmental Design*. The LEED® green building certification program is the nationally accepted benchmark for the design, construction, and operation of green buildings.

The use of Sunoptics Prismatic Skylights in green building design provides multiple opportunities for a project to earn credit toward LEED® points. These opportunities are presented below in conjunction with the LEED 2009 guidelines for New Construction and Major Renovation where the opportunities may exist.

- Define “green building” by establishing a common standard of measurement
- Promote integrated, whole-building design practices
- Recognize environmental leadership in the building industry
- Stimulate green competition
- Raise consumer awareness of green building benefits
- Transform the building market

LEED® provides a complete framework for assessing building performance and meeting sustainability goals.

Based on well-founded scientific standards, LEED® emphasizes state of the art strategies for

sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

## Certification Levels

Certified	40–49 points
Silver	50–59 points
Gold	60–79 points
Platinum	80 points +

LEED® recognizes achievements and promotes expertise in green building through a comprehensive system offering project certification, professional accreditation, training and practical resources.

The major LEED® Green Building Rating System® product today is LEED 2009 for New Construction and Renovation. It is designed for new construction and major renovation of buildings. Under this product there are six key sections:

- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy and Atmosphere (EA)
- Materials and Resources (MR)
- Indoor Environmental Quality (IEQ)
- Innovation in Design (ID)
- Regional Priority (RP)

Within each of these sections there are prerequisites and credit opportunities that provide a guideline toward building certification.

# Pertinent Sections LEED® 2009 New Construction and Major Renovation

## EA Prerequisite 2: Minimum Energy Performance Required

### Intent

To establish the minimum level of energy efficiency for the proposed building and systems to reduce environmental and economic impacts associated with excessive energy use.

### Requirements

#### Select **OPTION 1. Whole Building Energy Simulation**

Demonstrate a 10% improvement in the proposed building performance rating for new buildings, or a 5% improvement in the proposed building performance rating for major renovations to existing buildings, compared with the baseline building performance rating.

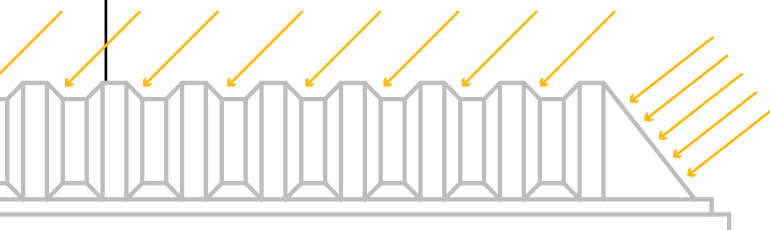
Calculate the baseline building performance rating according to the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 using a computer simulation model for the whole building project.

Appendix G of Standard 90.1-2007 requires that the energy analysis done for the building performance rating method includes all energy costs associated with the building project. To achieve points using this credit, the proposed design must meet the following criteria:

- Comply with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2007.
- Include all energy costs associated with the building project.
- Compare against a baseline building that complies with Appendix G of Standard 90.1-2007. The default process energy cost is 25% of the total energy cost for the baseline building. If the building’s process energy cost is less than 25% of the baseline building energy cost, the LEED submittal must include documentation substantiating that process energy inputs are appropriate.

### Note:

**Under this section, it is advantageous to design the building envelope, HVAC, lighting, and other systems to maximize energy performance.** Installing Sunoptics Prismatic Skylights along with lighting controls to maximize energy efficiency through reduced electric lighting use can easily help designers in achieving and exceeding minimum energy efficiency standards required in this section.



# s in Construction tion

## EA Credit 1: Optimize Energy Performance 1–19 Points

### Intent

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

### Requirements

Select the compliance path option described below. Project teams documenting achievement using this option are assumed to be in compliance with EA Prerequisite 2: Minimum Energy Performance.

#### OPTION 1. Whole Building Energy Simulation (1–19 points)

Demonstrate a percentage improvement in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda) using a computer simulation model for the whole building project.

The minimum energy cost savings percentage for each point threshold is as follows:

New Buildings	Existing Building/Renovations	Points
12%	8%	1
14%	10%	2
16%	12%	3
18%	14%	4
20%	16%	5
22%	18%	6
24%	20%	7
26%	22%	8
28%	24%	9
30%	26%	10
32%	28%	11
34%	30%	12
36%	32%	13
38%	34%	14
40%	36%	15
42%	38%	16
44%	40%	17
46%	42%	18
48%	44%	19

#### Note:

**Sunoptics Prismatic Skylights have been proven to provide a minimum of 50% more diffused natural light than standard white bubble skylights.** Effective daylighting measures utilizing Sunoptics Prismatic Skylights can replace electrical lighting needs by as much as 70% during daylight hours. Since the goal of this section is to maximize energy performance over baseline construction practices, the effective use of daylighting strategies utilizing Sunoptics Prismatic Skylights, lighting controls and energy efficient lighting can dramatically reduce energy consumption during peak energy periods as well as reduce HVAC cooling loads caused by the use of electrical lighting systems.

## MR Credit 5: Regional Materials 1–2 Points

### Intent

To increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

### Requirements

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% or 20%, based on cost, of the total materials value.

#### Note:

**Sunoptics Prismatic Skylights may contribute to this point for projects within a 500 mile radius of our factory in Sacramento, California.**

## MR Credit 4: Recycled Content 1–2 Points

### Intent

To increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

The minimum percentage materials recycled for each point threshold is as follows:

Recycled Content	Points
10%	1
20%	2

### Requirements

Use materials with recycled content such that the sum of post-consumer recycled content plus 1/2 of the pre-consumer content constitutes at least 10% or 20%, based on cost, of the total value of the materials in the project.

The recycled content value of a material assembly is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

#### Note:

**For over 30 years, Sunoptics Prismatic Skylights has made a commitment to the environment by maximizing post-consumer and pre-consumer recycled content in their glazing materials as well as their aluminum extrusions.** Sunoptics Prismatic Skylights utilize 50% post-industrial content and 25% post-consumer recycled content in our aluminum, which may contribute toward obtaining this LEED point. Sunoptics recycles 100% of their post-industrial waste in plastics and aluminum.

# IE Q Credit 8.1: Daylight and Views – Daylight

## 1 Point

### Intent

To provide building occupants with a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

### Requirements

Through 1 of 4 options, achieve daylighting in at least the following spaces:

Regularly Occupied Spaces	Points
75%	1

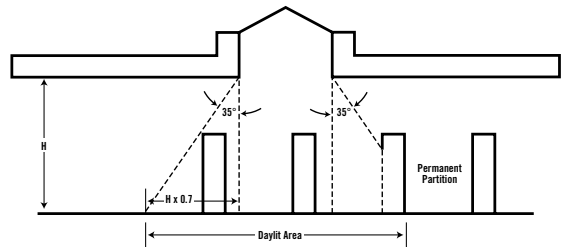
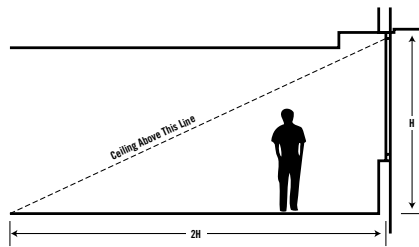
### Option 1. Simulation

Demonstrate through computer simulations that 75% or more of all regularly occupied spaces achieve daylight illuminance levels of a minimum of 25 foot candles (fc) and a maximum of 500 fc in a clear sky condition on September 21 at 9 a.m. and 3 p.m. Areas with illuminance levels below or above the range do not comply.

However, designs that incorporate view-preserving automated shades for glare control may demonstrate compliance for only the minimum 25 fc illuminance level.

### Option 2. Prescriptive

Use a combination of side-lighting and/or top-lighting to achieve a



total daylighting zone (the floor area meeting the following requirements) that is at least 75% of all the regularly occupied spaces.

For Top-lighting Daylight Zone (see diagram above):

- The daylight zone under a skylight is the outline of the opening beneath the skylight, plus in each direction the lesser of:
  - 70% of the ceiling height, *or*
  - 1/2 the distance to the edge of the nearest skylight, *or*
  - The distance to any permanent opaque partition (if transparent show VLT) farther than 70% of the distance between the top of the partition and the ceiling.
- Achieve skylight roof coverage between 3% and 6% of the roof area with a minimum 0.5 VLT.
- The distance between the skylights must not be more than 1.4 times the ceiling height.
- A skylight diffuser, if used, must have a measured haze value of greater than 90% when tested according to ASTM D1003. Avoid direct line of sight to the skylight diffuser.

- Exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.

### Option 3. Measurement

Demonstrate through records of indoor light measurements that a minimum daylight illumination level of 25 fc has been achieved in at least 75% of all regularly occupied areas. Measurements must be taken on a 10-foot grid for all occupied spaces and recorded on building floor plans. Only the square footage associated with the portions of rooms or spaces meeting the minimum illumination requirements may be counted in the calculations.

#### Note:

As was stated before, Sunoptics Prismatic Skylights have been proven to provide 50% more diffused natural light than standard white bubble skylights without hot spots, glare or the damaging effects of UV. Since LEED design protocols were created for a multitude of building types and sizes, it is difficult for designers to utilize natural daylight as a lighting or energy efficiency measure solely through the use of side window glazing or clerestory in large facilities with deep spaces. By utilizing Sunoptics Prismatic Skylights in conjunction with vertical glazing designs, a designer can easily and effectively bring the maximum amount of diffused natural light into central spaces of a facility or office space with results that far exceed competitive skylight products in both results and effectiveness.

Source: U.S. Green Building Council (2009), *LEED 2009 New Construction and Major Renovations*. LEED® is a registered trademark of the U.S. Green Building Council

For all projects pursuing this option, provide daylight redirection and/or glare control devices to avoid high contrast situations that could impede visual tasks. Exceptions for areas where tasks would be hindered by daylight will be considered on their merits.

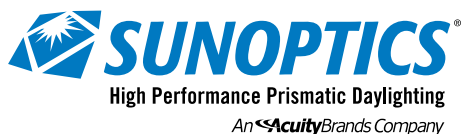
### Option 4. Combination

Any of the above calculation methods may be combined to document the minimum daylight illumination in at least 75% of all regularly occupied spaces. The different methods used in each space must be clearly recorded on all building plans.

Since 1978, Sunoptics has been the innovator in high-performance daylighting, featuring our unique, patented prismatic skylight design.

As the global leader in daylighting, with approximately one billion square feet of daylit space and growing, we are saving thousands of clients, hundreds of millions of dollars,

and making a significant impact on the environment by eliminating their dependence on electric lights during daylight hours. **After all, there's no greater efficiency than off!**



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