

LEED v4

Excerpt from Leed Green Associate V4 Exam Compete Study Guid, by Togay Koralturk, 2016

DAYLIGHT – CREDIT

- 1-3 Points

CREDIT SUMMARY

Studies show that increased access to daylight presents lots of benefits to human health and psychology. Exposure to daylight improves student performances², patient healing times, increases productivity in offices³, and also helps to fight depression. By introducing daylight into the interior spaces, the projects will also reduce their lighting costs. However, the project teams should also consider the heat gains and losses that will result from daylighting.

The credit sets requirements for daylight qualities and levels, and points are awarded according to the daylight modeling process used and the percentage of the floor area with daylight access.

To maximize daylight in the interior spaces, transparent partitions or interior glazing can be used, such as interior windows placed in walls or doors. Low height partitions in open offices can also increase the amount of daylight.

One problem with daylighting is the glare that the sun creates. The use of glare control devices is required in this credit, such as operable window blinds or curtains. Fixed glare control devices, such as fixed exterior overhangs, fixed fins, fixed louvres, dark color glazing, frit glazing treatment, or additional glazing treatments will not satisfy the credit. Acceptable glare control devices include: interior window blinds, interior shades, curtains, moveable exterior louvres, moveable screens, and moveable awnings.

The credit also mentions **spatial daylight autonomy (sDA)**, which is a metric used to describe the annual sufficiency of ambient daylight in building interiors.

CREDIT INTENT

Connecting building occupants with outdoors, reinforce circadian rhythms and also reducing power consumption of electrical lighting by using daylight.

CREDIT REQUIREMENTS

Provide automatic (with manual override) or manual glare-control devices for all regularly occupied spaces. And then, select one of the three options below:

Option 1: Simulation: Spatial Daylight Autonomy – 2-3 points

Implement a computer simulation and demonstrate that spatial daylight autonomy (sDA)

300/50% (sDA300/50%) of at least 55%, 75%, or 90% is achieved. Use regularly occupied floor area in the simulation. Points will be awarded according to the table 24:

sDA for regularly occupied floor area	Points
55%	2
75%	3

Table 24

AND

By performing computer simulations, demonstrate that annual sunlight exposure 1000,250 (ASE1000,250) of no more than 10% is achieved. Use the regularly occupied floor area that is daylit per the sDA300/50% simulations. An hourly time - step analysis based on typical meteorological year data should be used from the nearest available weather station. Include any permanent interior obstructions to sunlight. Movable furniture and partitions can be excluded.

OR

Option 2: Simulation: Illuminance calculations - 1-2Points

With the use of computer modeling, demonstrate that the illuminance levels will be between 300 lux and 3,000 lux for 9 a.m. and 3 p.m. (both on a clear-sky day at the equinox) for the floor area percentages indicated in table 25. Use regularly occupied floor area.

% of regularly occupied floor area	Points
75%	1
90%	2

Table 25

Calculate illuminance intensity for sun (direct component) and sky (diffuse component) for clear-sky conditions as follows:

- Use typical meteorological year data of the nearest available weather station.
- Select one day within 15 days of September 21 and the other day within 15 days of March 21 which should represent the clearest sky condition
- The average of the hourly value should be used for the two selected days

Blinds or shades moveable furniture and partitions may be excluded from the model. Any permanent interior obstructions to sunlight should be included.

Option 3: Measurement – 2-3 Points

Achieve illuminance levels between 300 lux and 3,000 lux for the percentage of floor area indicated by the table 26:

% of regularly occupied floor area	Points
75%	1
90%	2

Table 26

With furniture, fixtures and equipments all in place, measure illuminance levels as follows:

- Measure at appropriate work plane height between 9 a.m. and 3 p.m.
- Take one measurement in any regularly occupied month and the second one as specified in the table 27
- Spaces larger than 150 square feet (14 square meters) should take measurements on a maximum 10 foot (3 meter) square grid
- For spaces 150 square feet (14 square meters) or smaller, take measurements on a maximum 3 foot (900 millimeters) square grid

If the first measurement was in,	then the second measurement should be in,
January	May-September
February	June-October
March	June-July, November-December
April	August-December
May	September-January
June	October-February
July	November-March
August	December-April
September	December-January, May-June
October	February-June
November	March-July
December	April-August

Table 27

KEY THINGS TO REMEMBER

- Definition of spatial daylight autonomy (sDA).
- The use of glare control devices is required in this credit like operable window blinds/curtains. In LEED, fixed glare control devices, like fixed exterior overhangs, fixed fins, fixed louvres, dark color glazing, frit glazing treatment, or additional glazing treatments do not qualify as glare control devices. The acceptable ones are; interior window blinds, interior shades, curtains, moveable exterior louvres, moveable screens and moveable awnings.
- To maximize daylight in the interior spaces, transparent partitions or interior glazing can be used, like interior windows placed in walls or doors. Using low height partitions in open offices will also increase the amount of daylight.