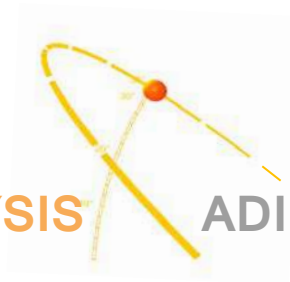


SUN LIGHTING ANALYSIS



ADIDAS OFFICE BUILDING

Skylight comparison study

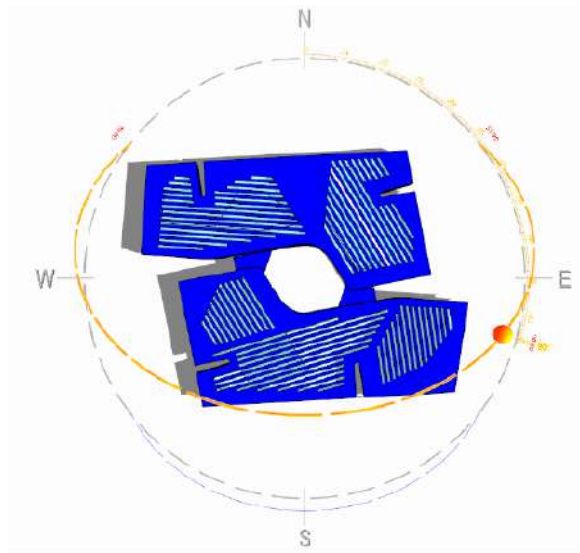
Nuremberg

Germany

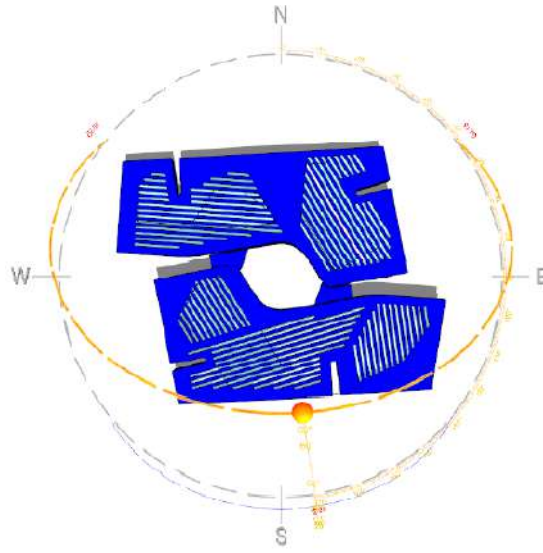
Solar shading

Summer solstice
June 21st

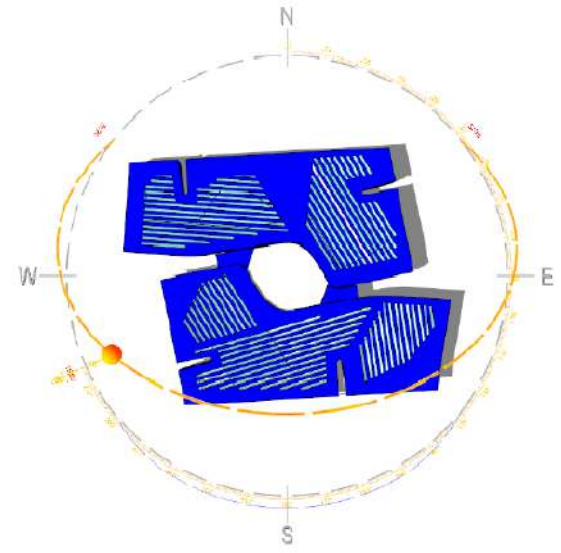
9:00 AM



12:00 PM



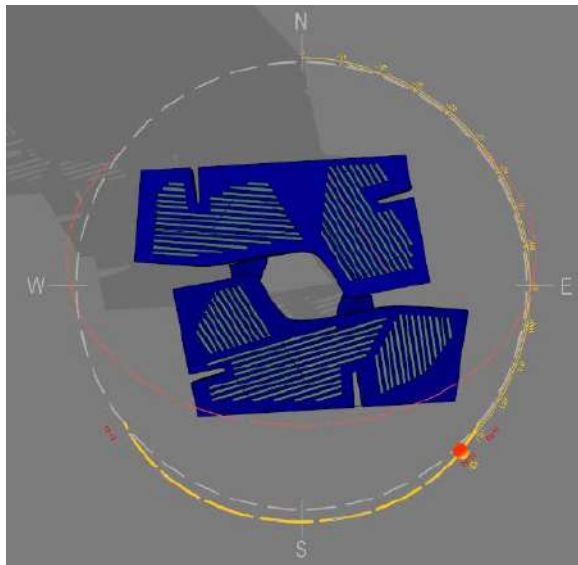
15:00 PM



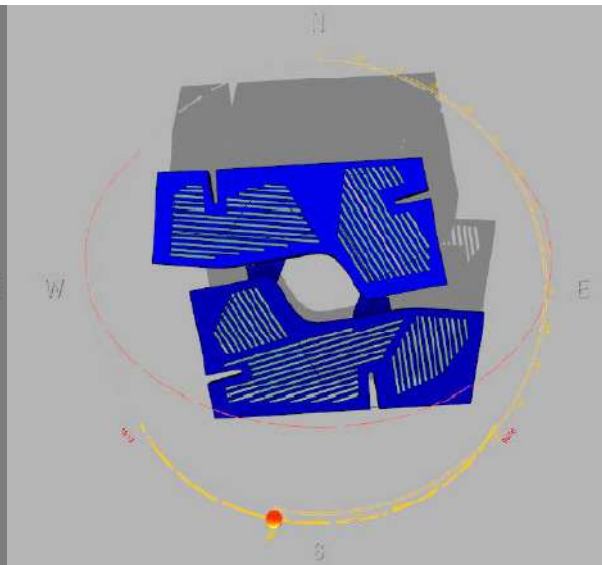
Solar shading

Winter solstice
December 21st

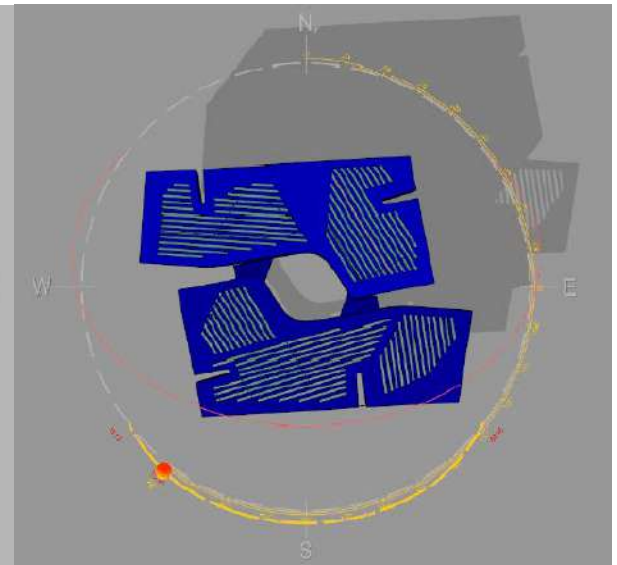
9:00 AM



12:00 PM



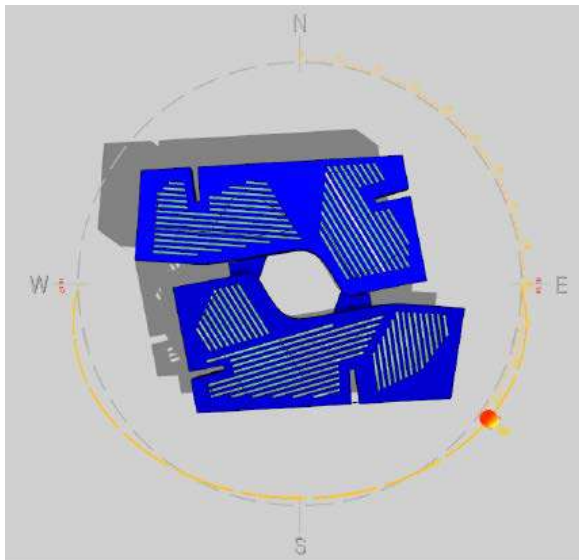
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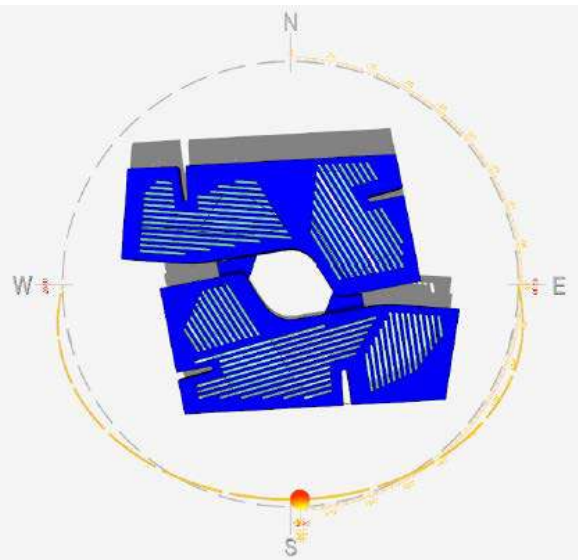
Solar shading

Equinox
March 21st

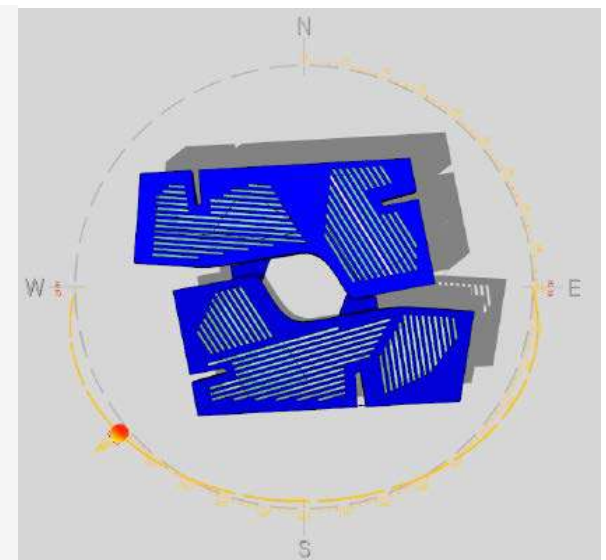
9:00 AM



12:00 PM



15:00 PM

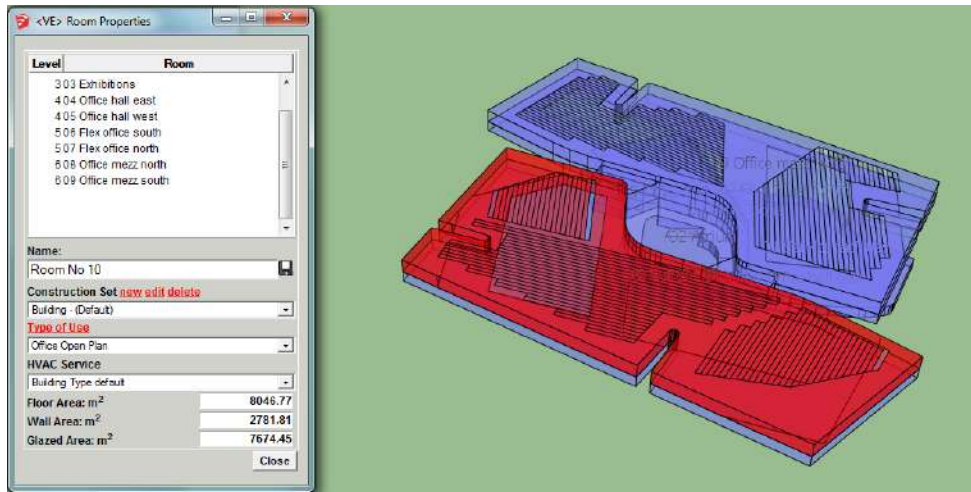


Day lighting factor

Analyzed zone

South office mezzanine

Room attributes



View: South office mezzanine [Sketchup 8.0]

Summery – Study cases

Cases	Skylight roof area	LEED Credit	IENSA guide
1 baseline	0%	Pass	Pass
2	13%	Pass	Pass
3	27%	Pass	Pass

Considerations

- LEED 2009 IEQ Credit 8.1: More than 75% of the floor area should be above threshold of 25fc or 270 lux.
- IESNA: Recommended brightness levels for reading task areas of 50 fc or 500 lux.

Parameters used for each case

- Illuminance: Planer - Horizontal
- Working plane: 0.8 m
- Margin: 0.15m or 6" (medium reflection quality)
- Sky model: CIE clear sky, Sept. 21st
- Sky time: 9:00 am and 3:00 pm
- Horizontal settings: 2090 lux or 380fc
- Glazing type: Low-e double glazing (6mm+6mm)
U = 3.247
VLT = 0.78 or 78%

Day lighting factor

Case 1 | Baseline model without skylight

Summary

Parameter	LEED Apply	Case 1
Average day lighting factor (lux)	270	757.7
Average day lighting factor (%)	2.0	10.9
Daylight illuminance levels (lux)	n/a	Min = 12.7 Max = 2091
Area above threshold (%)	75	97
LEED 8.1 Credit	--	Pass
IESNA guide (lux)	--	Pass

Day lighting filled contour plan

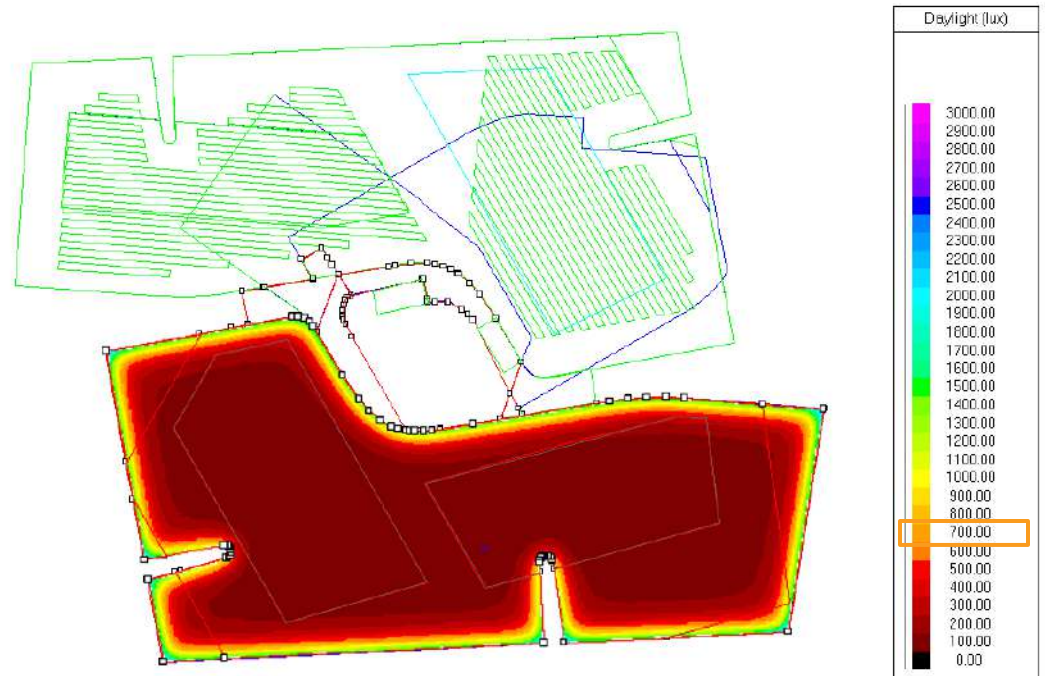


Diagram: Flucs DL [IES_VE]

Luminance simulation

Case 1 | Baseline model without skylight

Glare levels

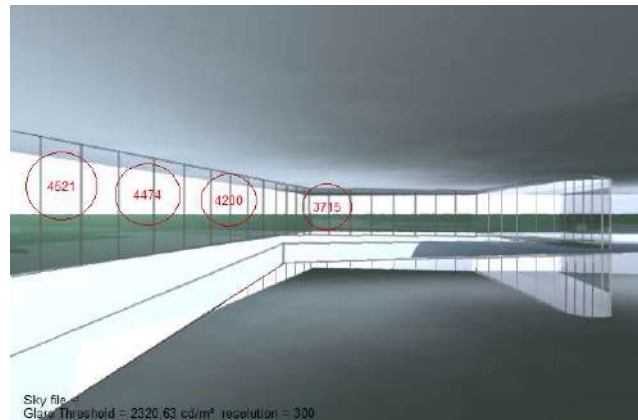


Image: Radiance [IES_VE]

Glare contours

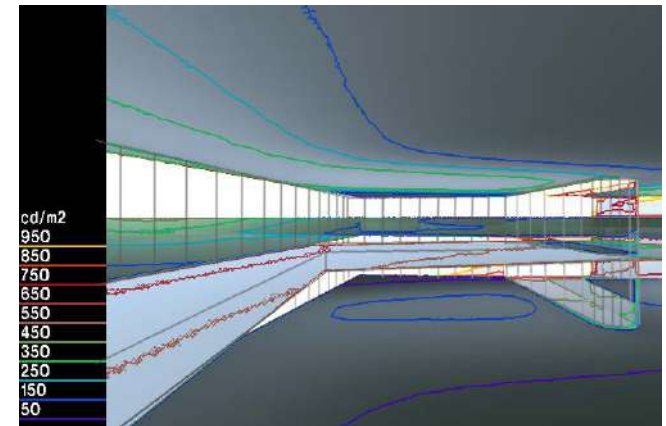


Image: Radiance [IES_VE]

Winter solstice

15:00 pm
Sunny sky
camera location



Summer solstice

9:00 am
Sunny sky
camera location

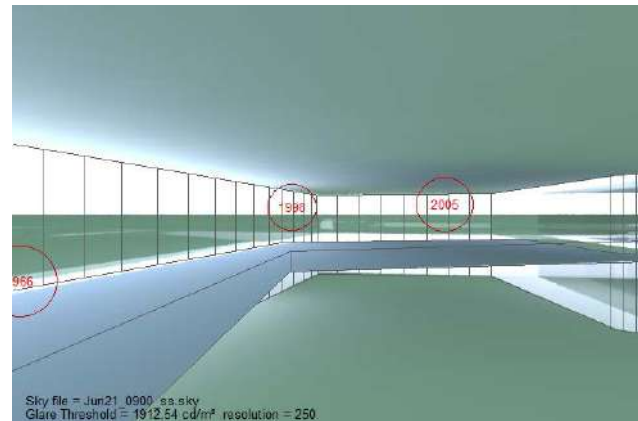


Image: Radiance [IES_VE]

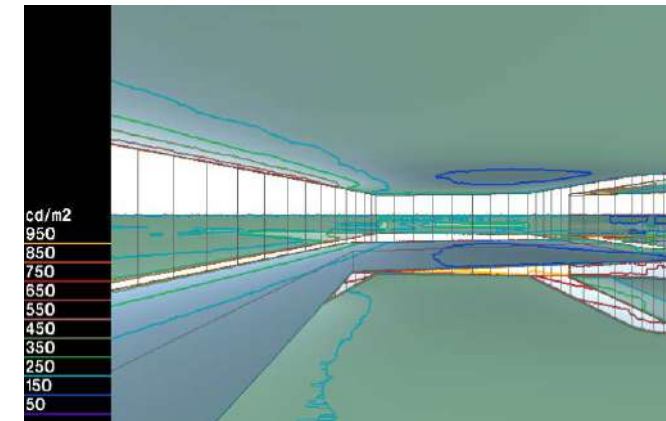


Image: Radiance [IES_VE]

Day lighting factor

Case 2 | 13% roof area with skylight

Summary

Parameter	LEED Apply	Case 2
Average day lighting factor (lux)	270	1384.5
Average day lighting factor (%)	2.0	19.9
Daylight illuminance levels (lux)	n/a	Min = 432.9 Max = 5206
Area above threshold (%)	75	100
LEED 8.1 Credit	--	Pass
IESNA guide (lux)	--	Pass *

* IESNA guidance for 1000 to 1500 lux work place:
Normal drawing work, detailed mechanical workshops,
operation theatres.

Day lighting filled contour plan

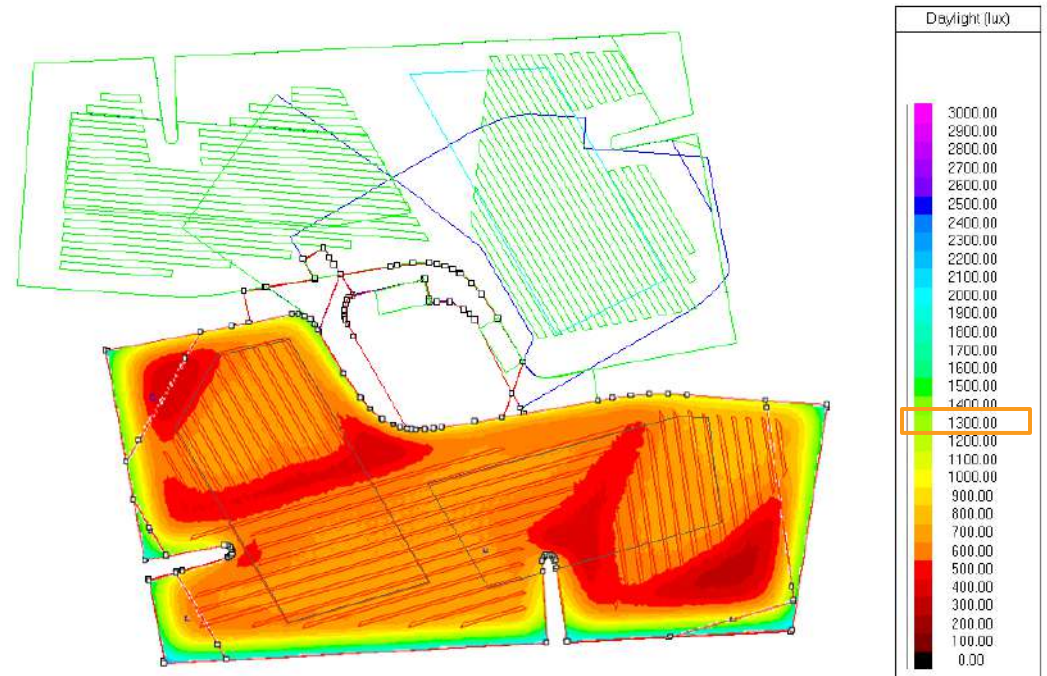


Diagram: Flucs DL [IES_VE]

Luminance simulation

Case 2 | 13% roof area with skylight

Winter solstice

15:00 pm
Sunny sky
camera location



Glare levels

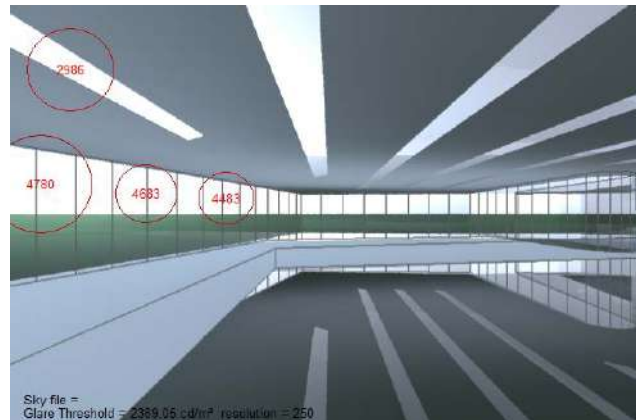


Image: Radiance [IES_VE]

Glare contours

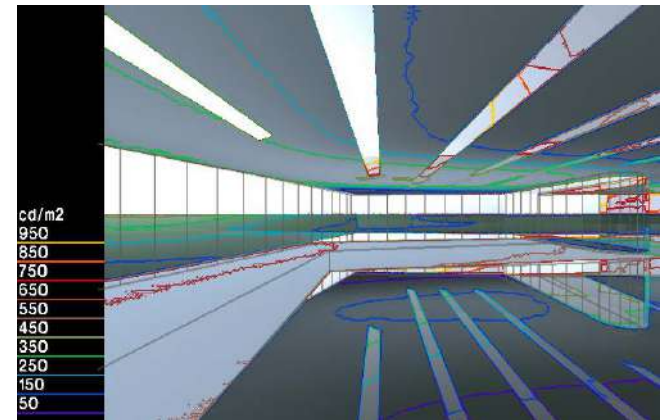


Image: Radiance [IES_VE]

Summer solstice

9:00 am
Sunny sky
camera location

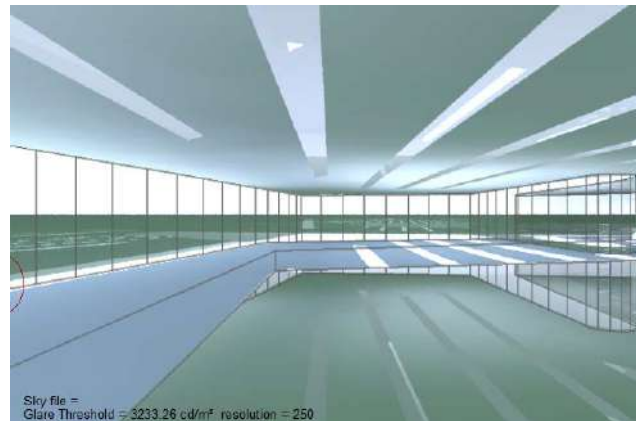


Image: Radiance [IES_VE]

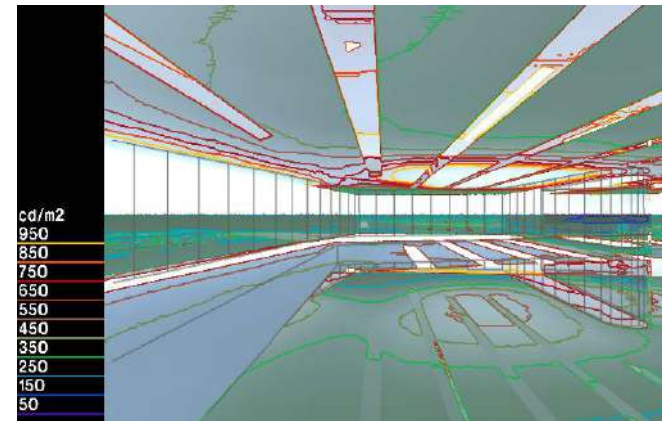


Image: Radiance [IES_VE]

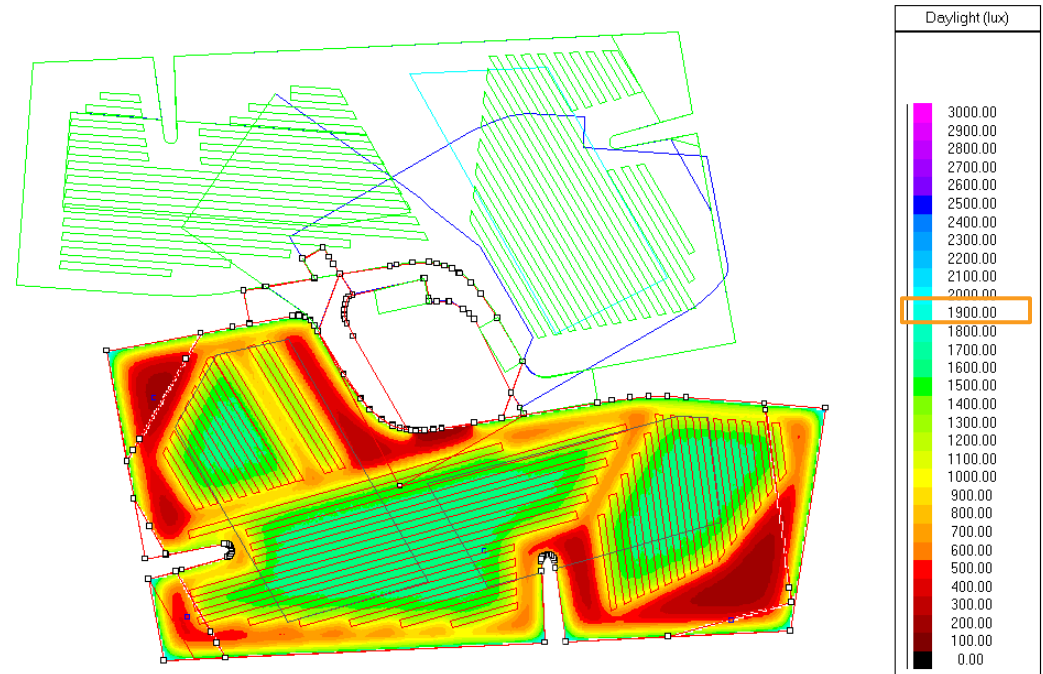
Day lighting factor

Case 3 | 27% roof area with skylight Architectural proposal

Summary

Parameter	LEED Apply	Case 3
Average day lighting factor (lux)	270	1982.5
Average day lighting factor (%)	2	28.6
Daylight illuminance levels (lux)	n/a	Min =260 Max = 2166
Area above threshold (%)	75	100
LEED 8.1 Credit	--	Pass
IESNA guide (lux)	--	Pass *

Day lighting filled contour plan



* IESNA guidance for 1500 to 2000 lux work place:
Detailed drawing work, very detailed mechanical works.

Diagram: Flucs DL [IES_VE]

Luminance simulation

Case 3 | 27% roof area with skylight

Winter solstice

15:00 pm
Sunny sky
camera location



Glare levels

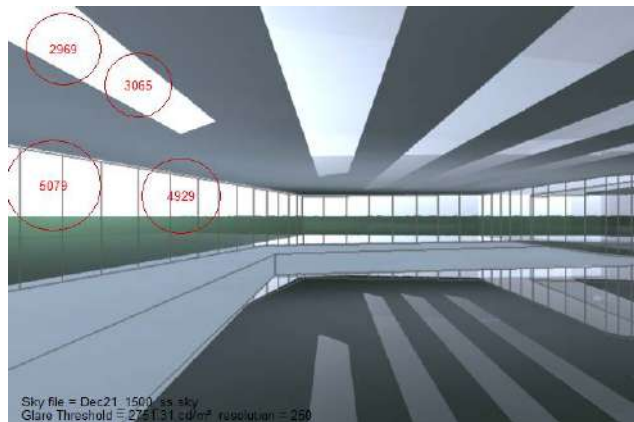


Image: Radiance [IES_VE]

Glare contours

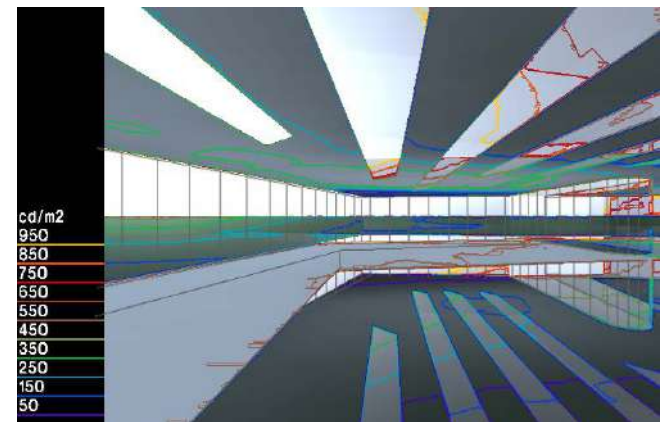


Image: Radiance [IES_VE]

Summer solstice

9:00 am
Sunny sky
camera location

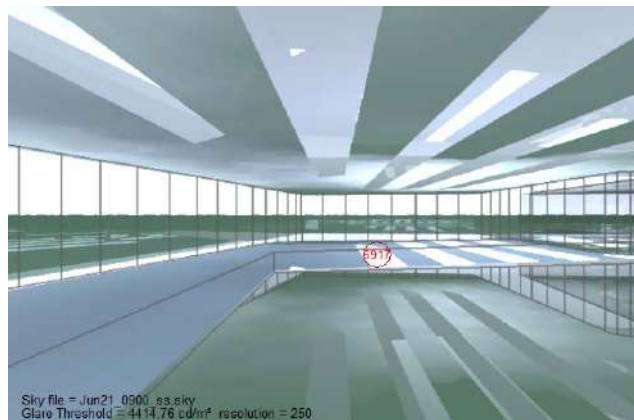


Image: Radiance [IES_VE]

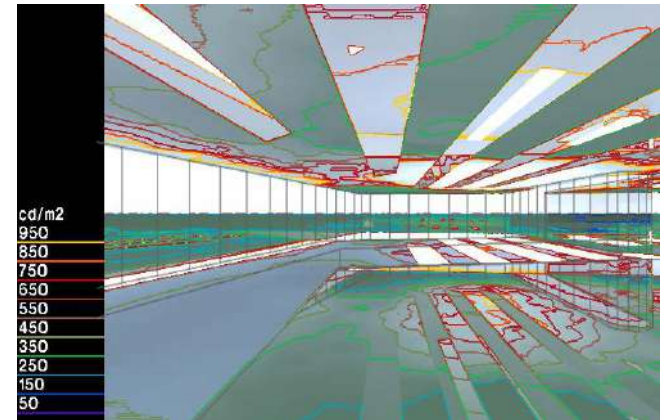


Image: Radiance [IES_VE]