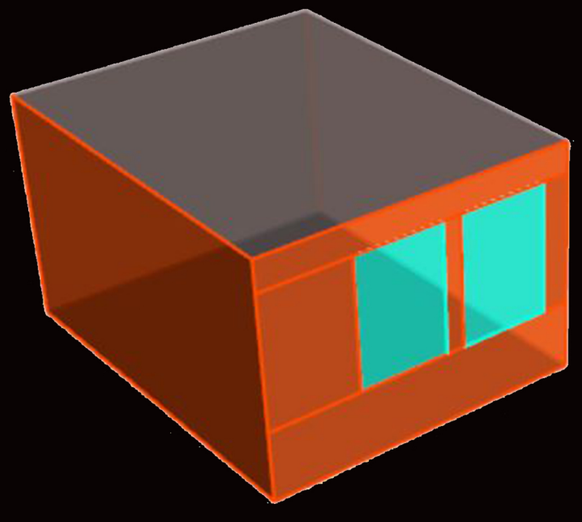
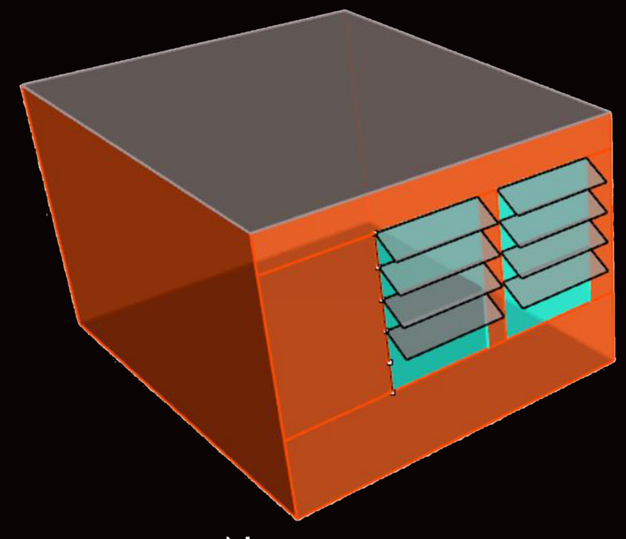
POINT BASED ANNUAL DAYLIGHT ANALYSIST- THE RE-EVALUATION



The half of the room is getting useful daylight through out the year. The area near the windows is getting more daylight, and it is causing visual discomfort as well.

N

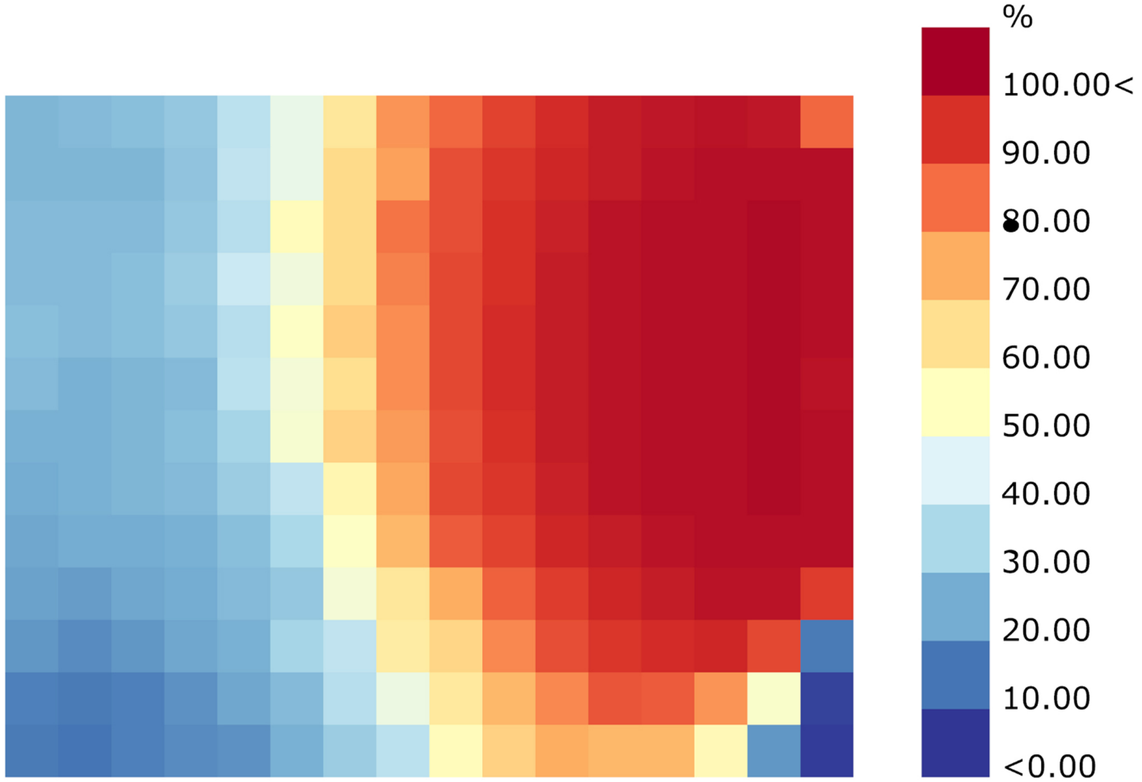
BASELINE SCENARIO



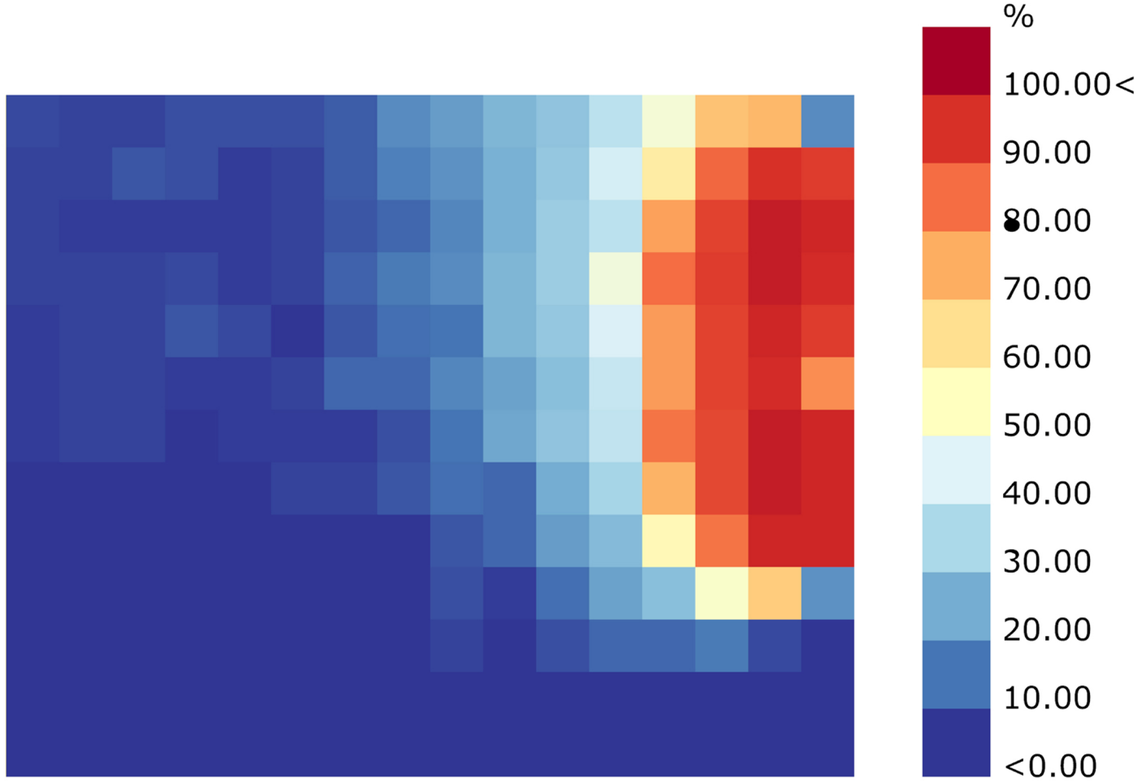
When we add horizontal shading devices, the percentage of the room getting UDI decreases. We need to redesign the room so that we can increase the UDI without causing visual discomfort.

N

PROPOSED DESIGN



Daylight Autonomy



Daylight Autonomy

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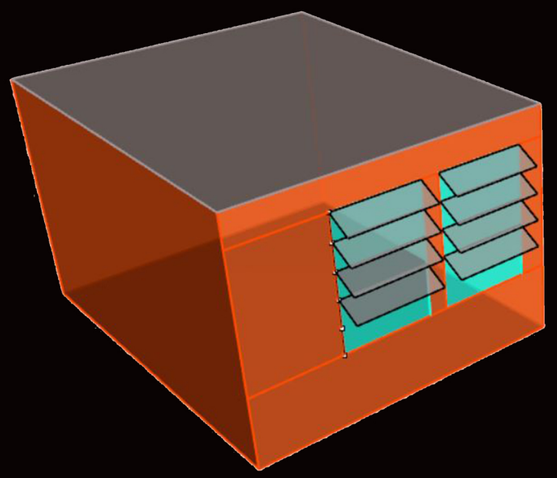
POINT BASED ANNUAL DAYLIGHT ANALYSIST- THE RE-EVALUATION

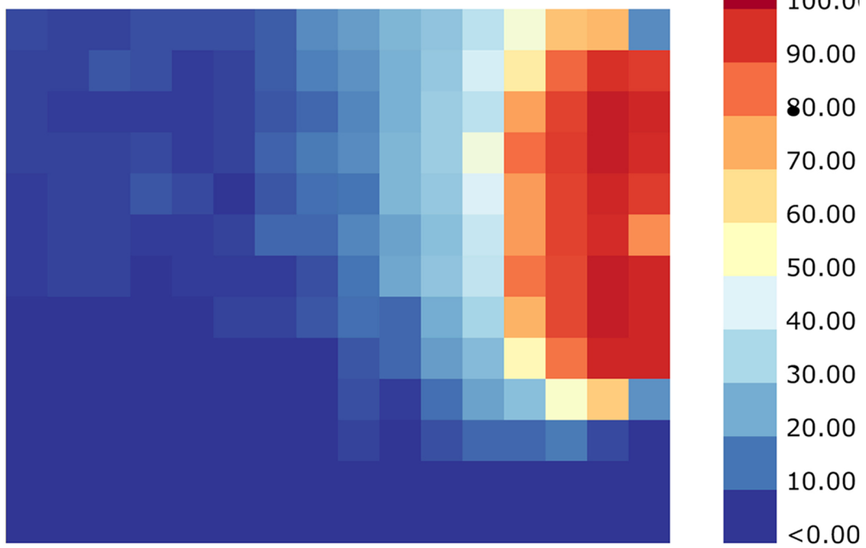


PROPOSED DESIGN

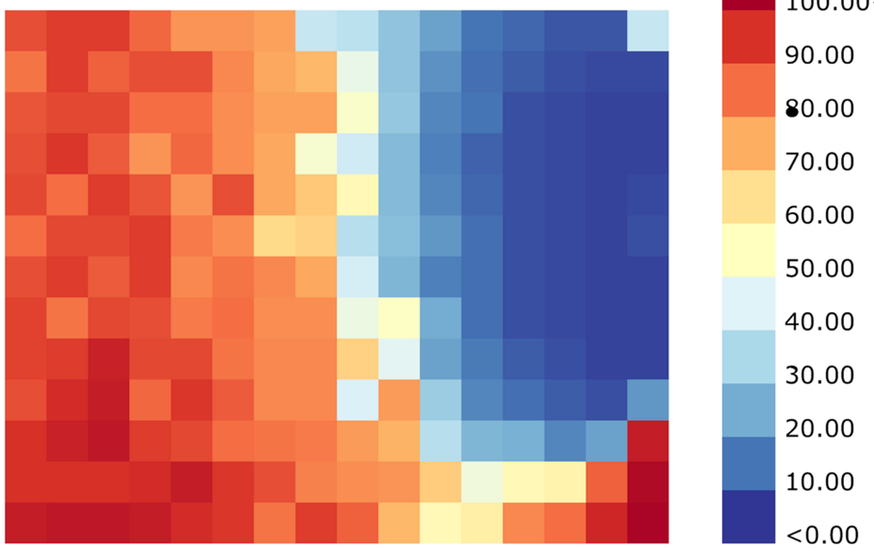
The design proposed earlier, provides useful daylight only in half of the room . The area which is away from the windows (the other half of the room) have daylighting less than 100 lux for approximately 80% of the times.

The design proposed didnot perform well . So we need to increase the useful daylight in the back of the room. Inorder to do so, I have changed the geometery of the windows and also added new windows.

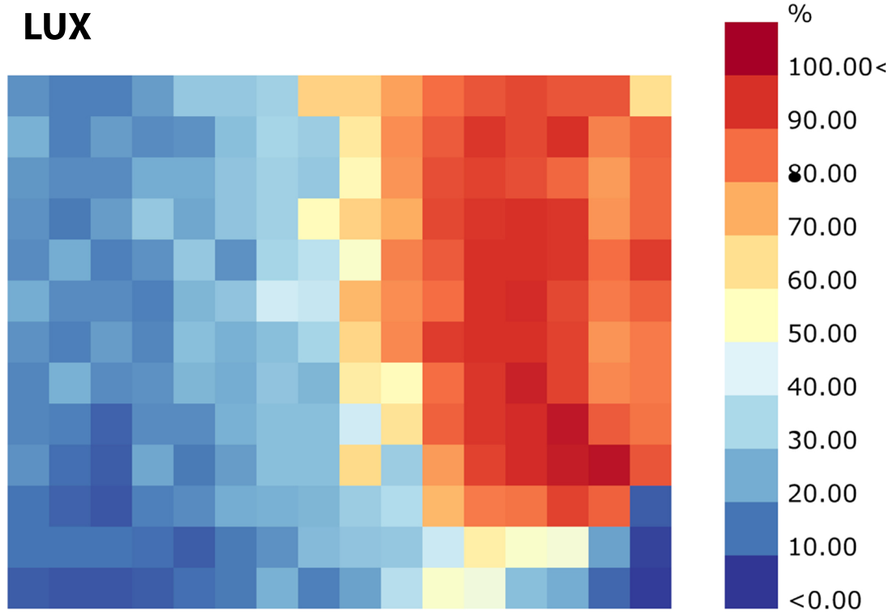
DAYLIGHT AUTONOMY



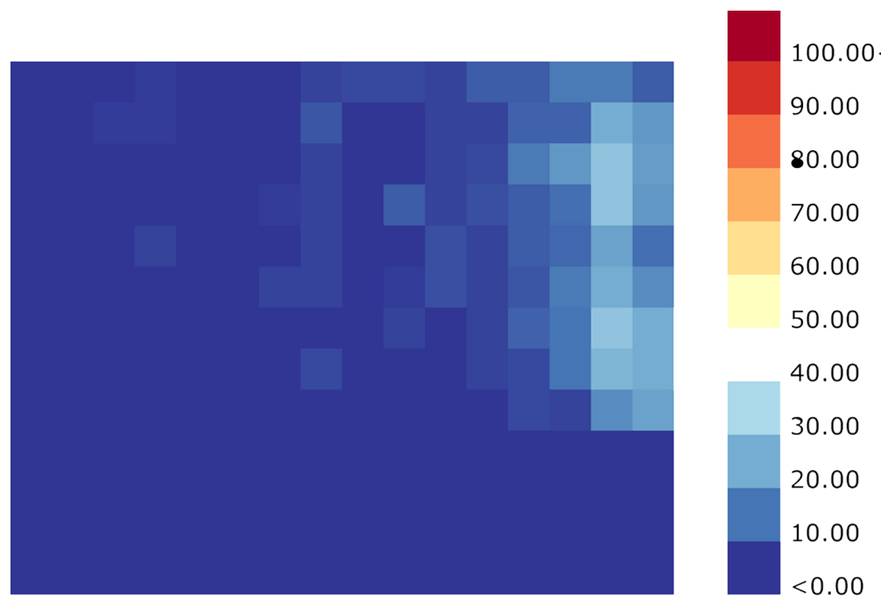
USEFULL DAYLIGHT ILLUMINANCE >100 LUX



USEFULL DAYLIGHT ILLUMINANCE 100 - 2000 LUX



USEFULL DAYLIGHT ILLUMINANCE>2000 LUX



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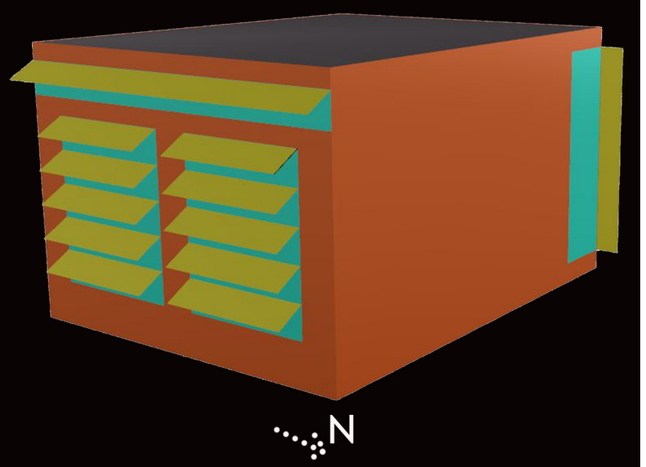
POINT BASED ANNUAL DAYLIGHT ANALYSIST- THE RE-EVALUATION

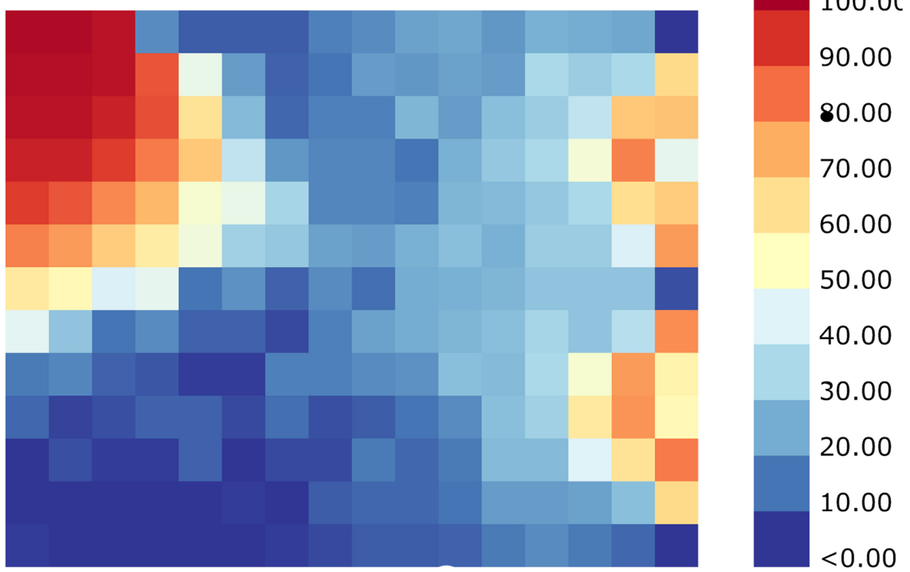
NEW PROPOSED DESIGN



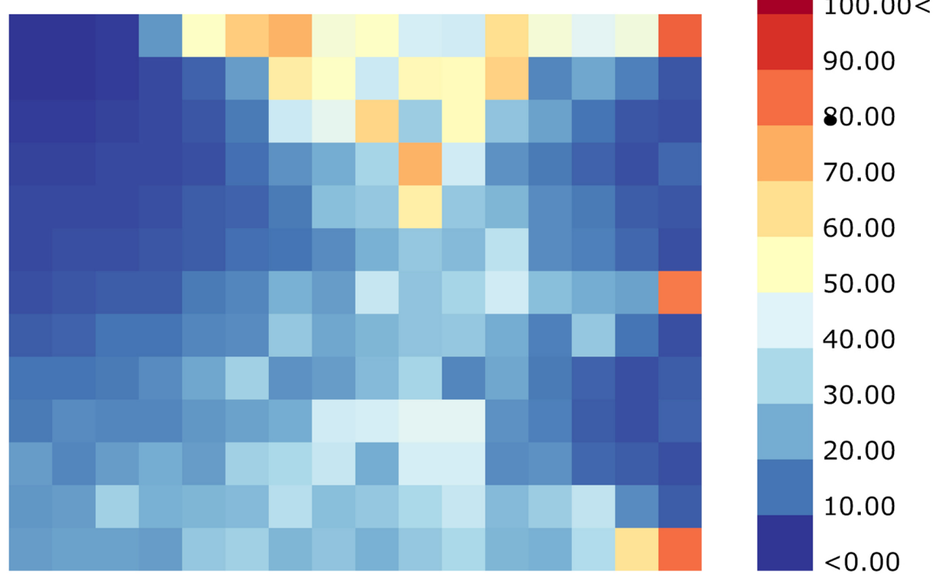
A window in the top has been made so that the light can penetrate till the end of the room, and for the same reason, a window in the north has been provided which will not cause glare and will increase the lighting in the room.

This scenario is performing better than the previous one, as more than 50 % of the room is getting useful daylight for more than 50 % of the times. 30% of the room is still getting daylight less than 100 Lux, so we still have scope to increase the UDI. Only the corner of the north window has daylight more than 2000 lux.

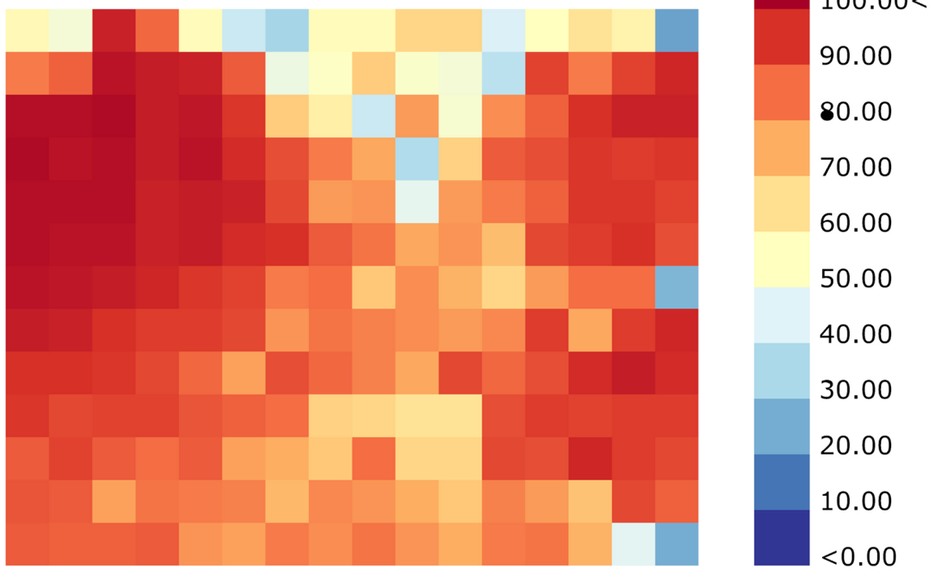
DAYLIGHT AUTONOMY



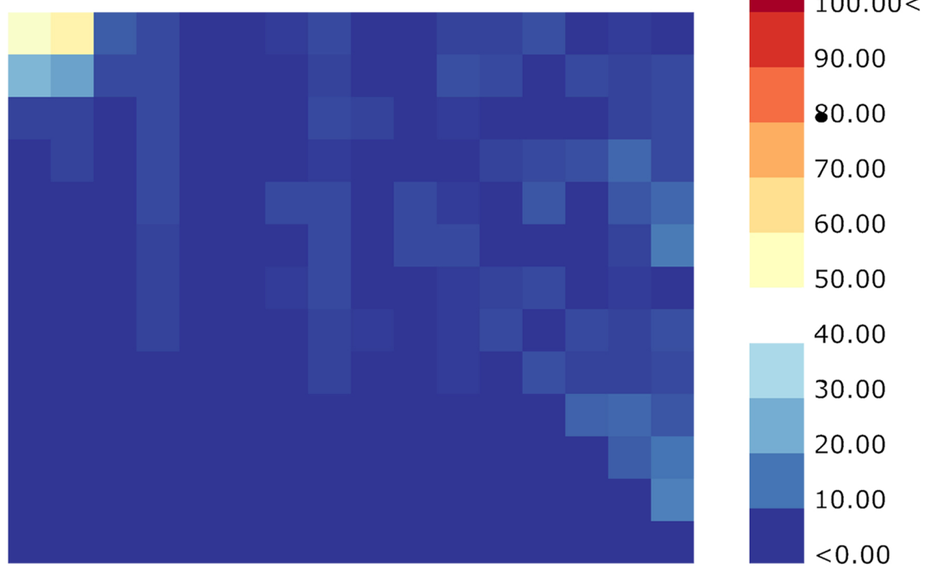
USEFULL DAYLIGHT ILLUMINANCE >100 LUX



USEFULL DAYLIGHT ILLUMINANCE 100 - 2000 LUX



USEFULL DAYLIGHT ILLUMINANCE>2000 LUX



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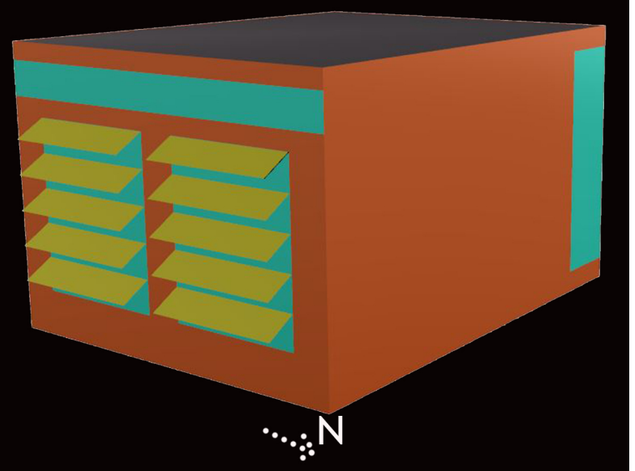
POINT BASED ANNUAL DAYLIGHT ANALYSIST- THE RE-EVALUATION

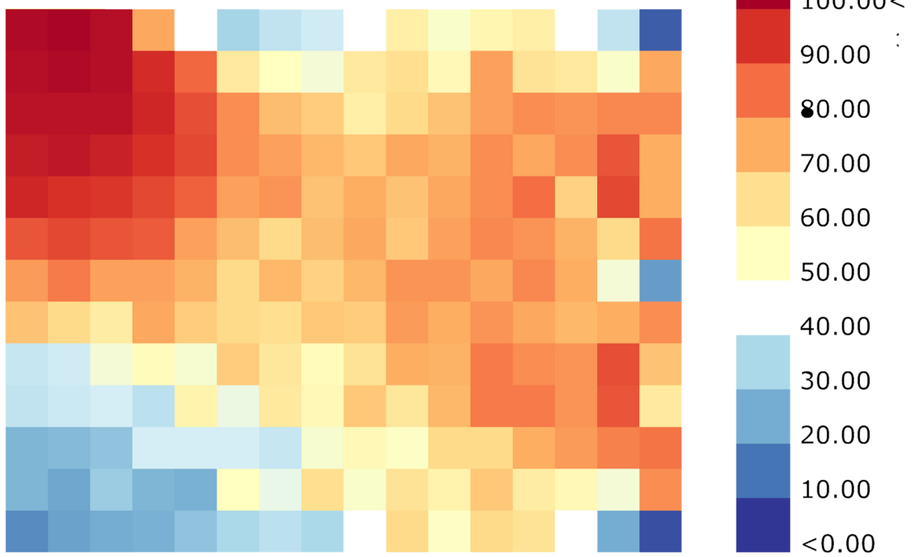
NEW PROPOSED DESIGN - II



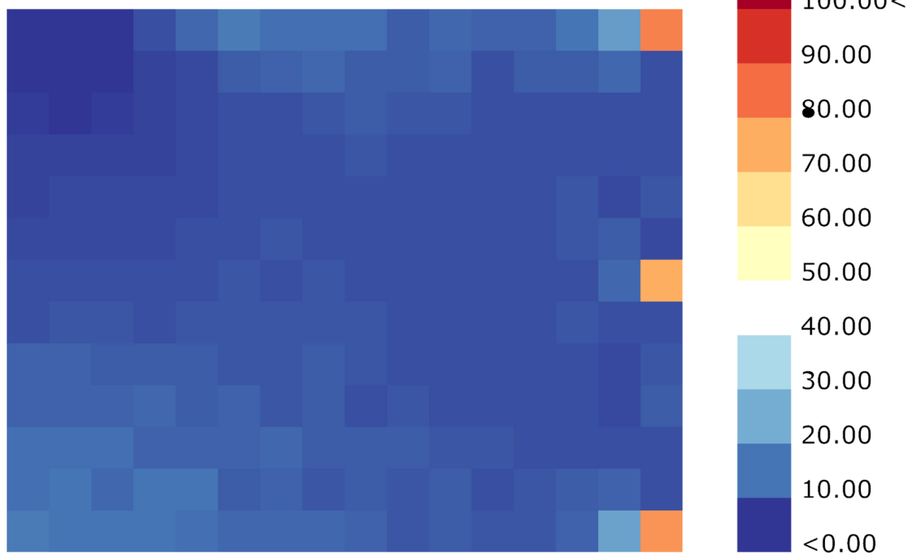
To increase the UDI of the room, a shade of upper slit and north window has been removed. More light enters the room. This scenario is performing the best, as more than 85 % of the room is getting useful daylighting for more than 80% of the times.
The area which has light less than 100 lux is negligible. The area near north side of the window has more than 2000 lux of daylight.

Further, materials and ambient bounce have been changed, to increase the UDI in the room.

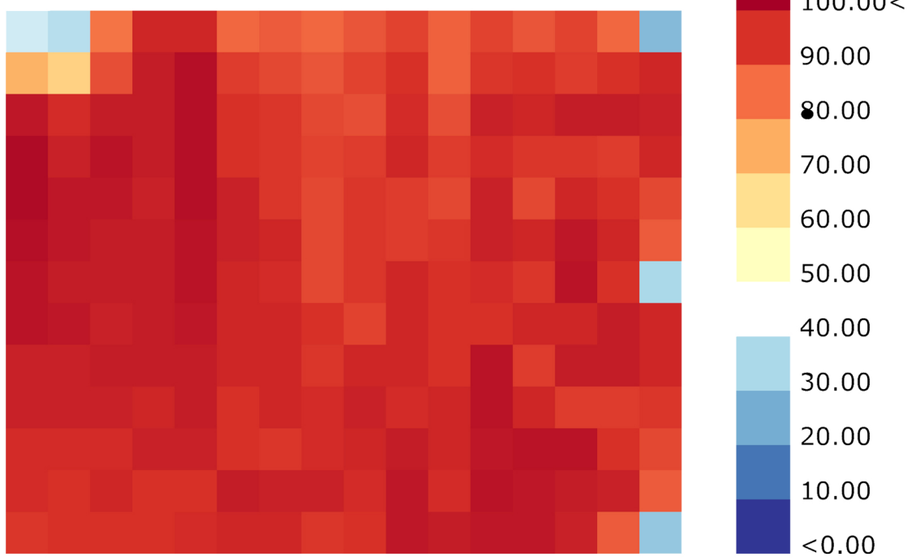
DAYLIGHT AUTONOMY



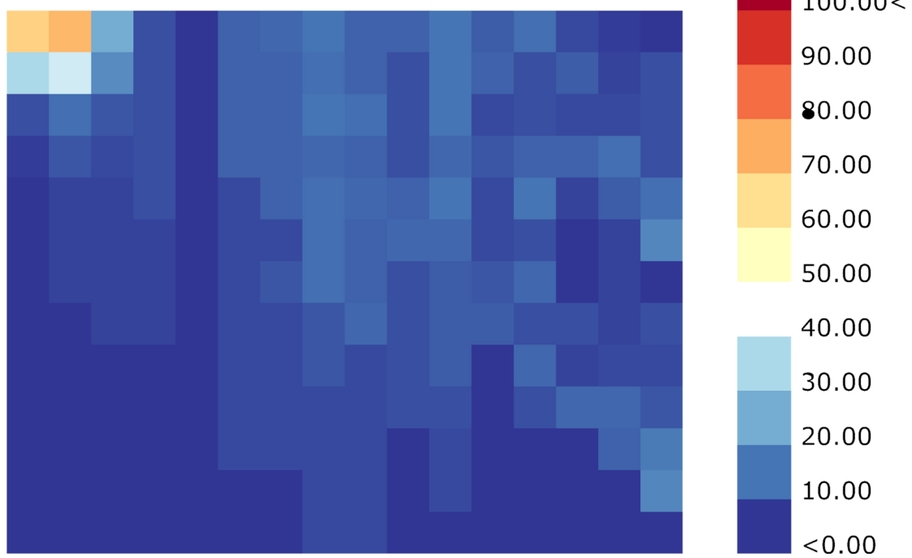
USEFULL DAYLIGHT ILLUMINANCE >100 LUX



USEFULL DAYLIGHT ILLUMINANCE 100 - 2000 LUX



USEFULL DAYLIGHT ILLUMINANCE>2000 LUX



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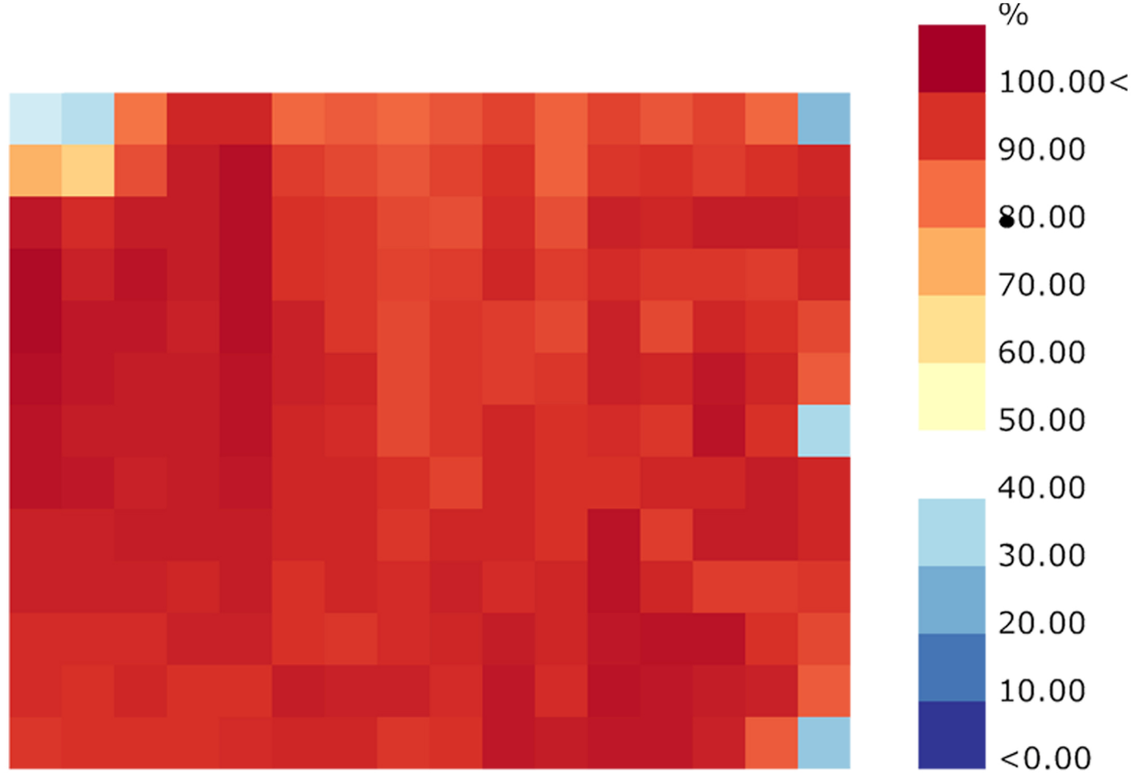
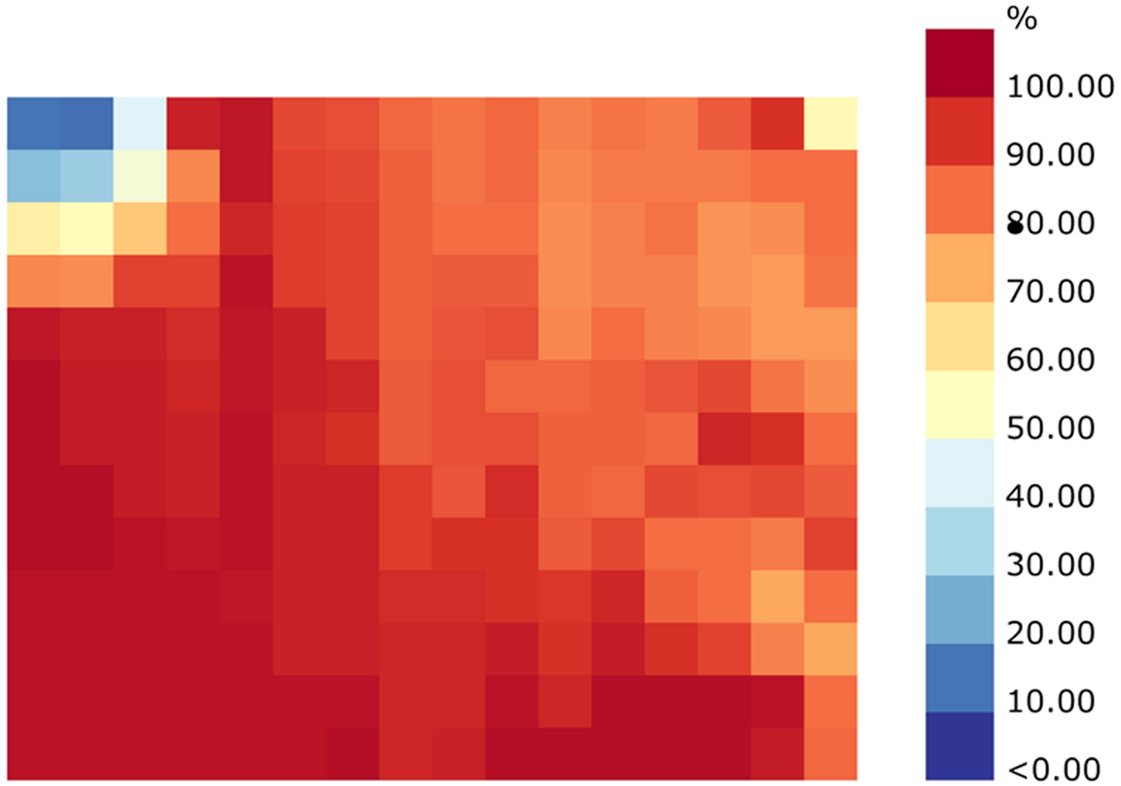
POINT BASED ANNUAL DAYLIGHT ANALYSIST- THE RE-EVALUATION

The analysis is done for proposed design - II.
More reflective materials have been used, to spread the light.
Comparison of the three scenarios:
We are not able to reduce the light in the north window in any of the three.
Change in geometry has a better impact on UDI, as compared to materials and radiance parameters.
The reflective materials are increasing the daylight, which is reducing the amount of useful daylight in the room.
So we would not prefer high reflectance material with the large opening of the windows. Also, if we increase the ambient bounces with highly reflective materials the UDI tend to reduce further, increasing the glare and more than necessary daylight in the room (>2000 lux)
Maximum UDI can be achieved in the base scenario only.

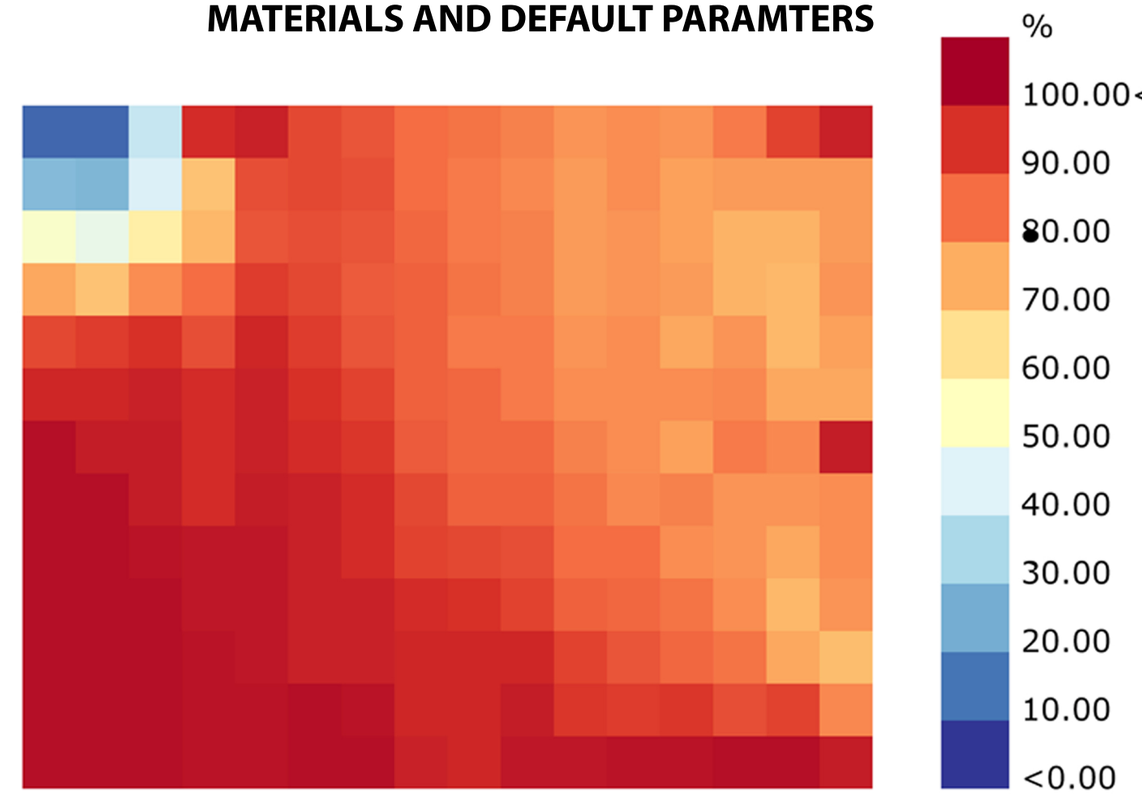


USEFULL DAYLIGHT ILLUMINANCE 100 - 2000 LUX - WITH BASE MATERIALS AND DEFAULT PARAMTERS



USEFULL DAYLIGHT ILLUMINANCE 100 - 2000 LUX - WITH VARIATION IN TYPE OF MATERIAL

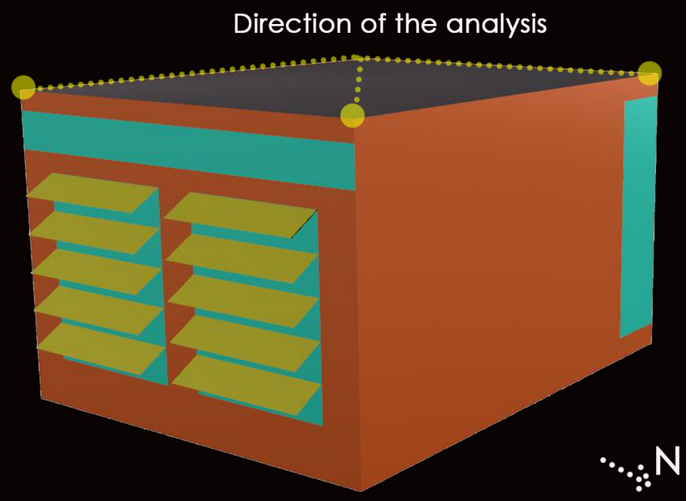
SINGLE PANE GLASS - .96 , HIGH REFLECTANCE CEILING- .90
WHITE INTERIOR WALLS - .70



USEFULL DAYLIGHT ILLUMINANCE 100 - 2000 LUX - WITH VARIATION IN ABIENT BOUNCES

AMBIENT BOUNCES - 3

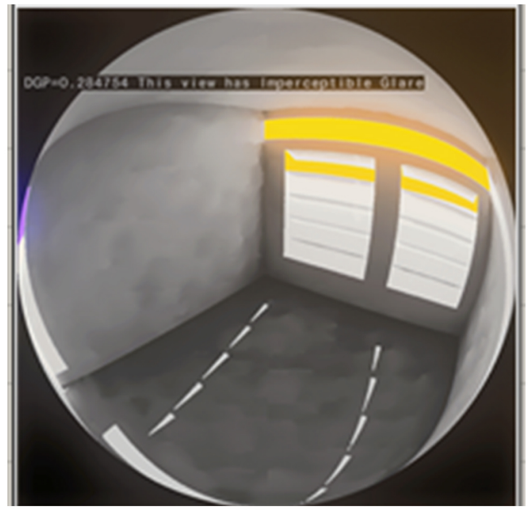
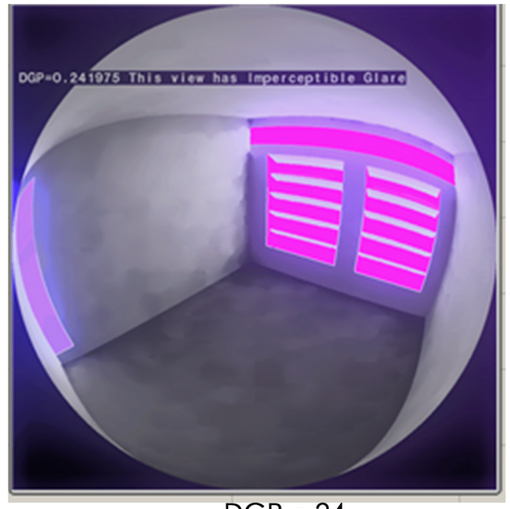
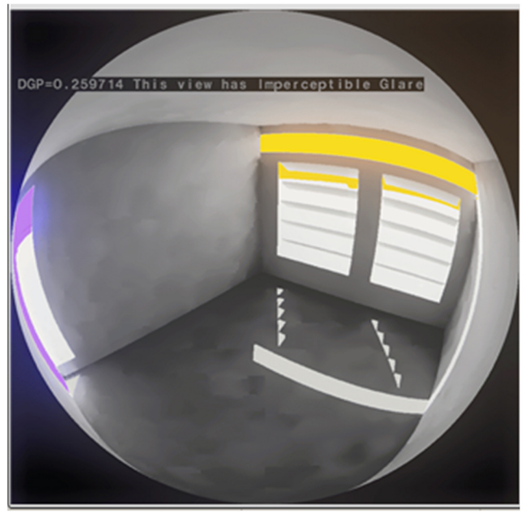
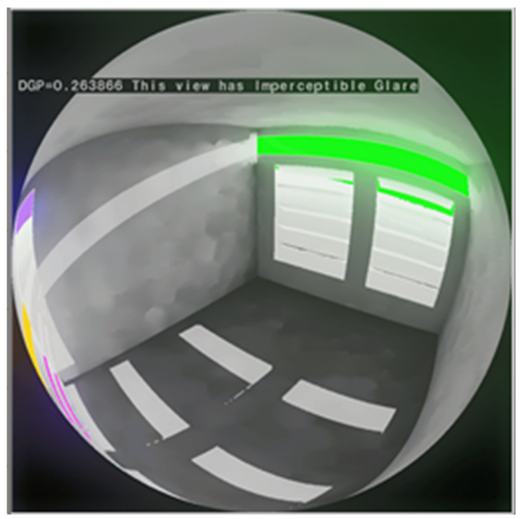
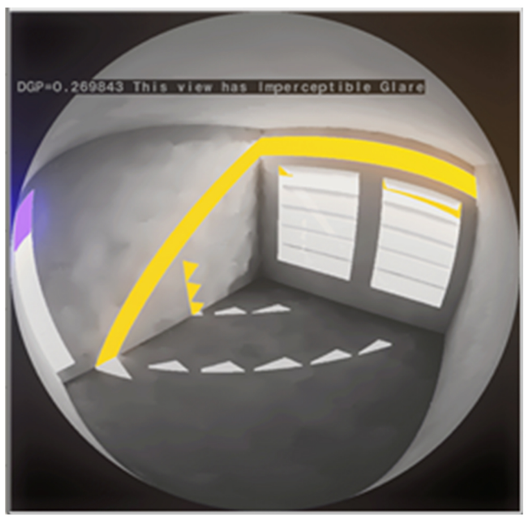
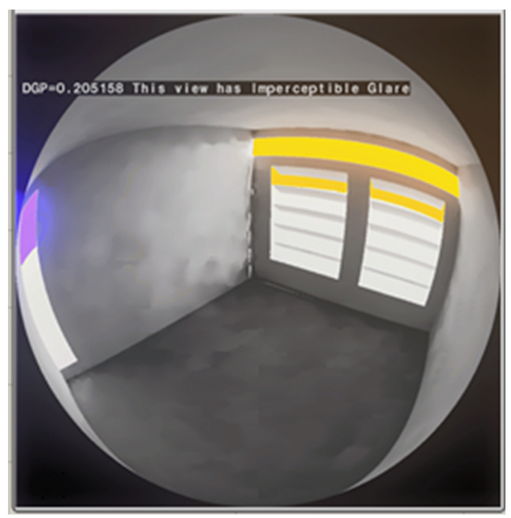
IMAGE BASED GLARE ANALYSIS FOR PROPOSED DESIGN



For 9-point image-based glare analysis, Daylight Glare Probability is less than .35 (imperceptible glare). There would be no visual discomfort to the occupant with the proposed shading.

Areas where, we are able to get direct sunlight, for few hours, the occupant can move his location or with the help of blinds, direct sunlight can be reduced depending on the occupant's will.

Maximum amount of direct sunlight is coming inside the during winter and morning 9:00 am, when the sun is not harsh and can be desired by some.

	9:00 AM	12:00 PM	15:00 PM
MARCH 21ST	 DGP =.28	 DGP =.25	 DGP =.24
JUNE 21ST	 DGP =.25	 DGP =.26	 DGP =.25
DECEMBER 21ST	 DGP =.26	 DGP =.26	 DGP =.20

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