



VERDACITY

WHERE BRILLIANT BUILDINGS COME NATURALLY

Monte Vista Elementary School

Simple Box Daylight Model

LEED for New Construction

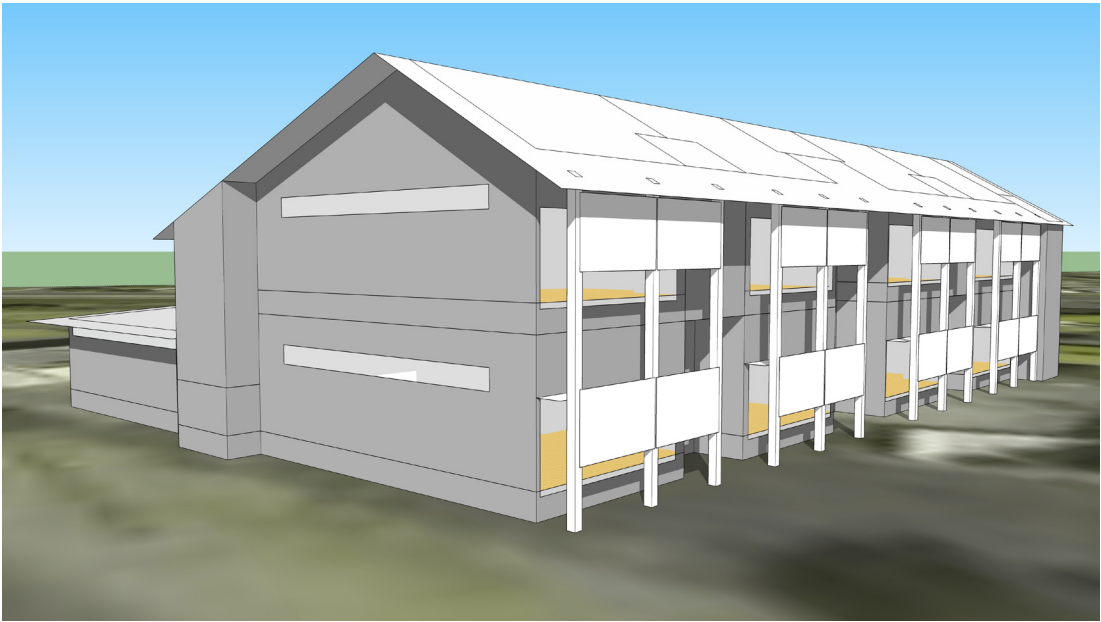
VERSION 4

SEPTEMBER 22, 2017



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Simple Box Daylighting Model



Project Intent

This evaluation is intended to provide the design team with early design documentation of daylight performance. Anticipated daylight penetration and illuminance is provide for select spaces. Anticipated annual daylight autonomy values are provided for the whole building. The analysis for daylight performance is conducted on a 2' grid at 30" AFF.

Project Assumptions

Visible Transmittance of Exterior Glazing:	70%	(Solarban 60)
Visible Transmittance of Interior Glazing:	90%	(Transparent)
Surface Reflectance Values:		
Wall:	60%	(Light Colored Gypsum)
Ceiling:	80%	(White Ceiling Tile)
Floor:	30%	(Light Colored Carpet)
External Shade Panels	95%	(White Paint)

Terminology

Daylighting: The passive illumination of buildings by natural light.

Illuminance Grid: An imaginary horizontal plane where daylight levels are measured; for the purposes of this report, the illuminance grid is set at 30” above finished floor.

Glare: Caused by a significant difference in the luminance levels between a task area (work station) and a light source.

Regularly Occupied Space: Areas where one or more individuals normally spend time (more than one hour per person per day on average) seated or standing as they work, study, or perform other focused activities inside a building.

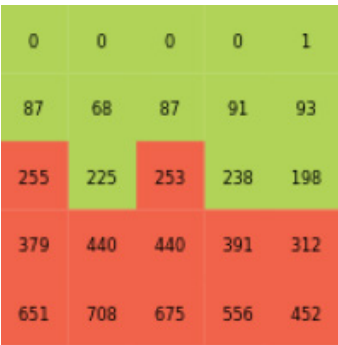
Annual Metrics

Spatial Daylight Autonomy_{300/50%}: sDA_{300/50%} is recommended as the preferred metric for analysis of daylight sufficiency. It uses an analysis illuminance threshold of 300 lux on horizontal



surfaces to assess the number of hours per year that each point within a given area meets or exceeds this value from daylight alone. Daylight conditions are based on typical meteorological year (TMY) data, with an analysis time period extending from 8am to 6pm local time (10 hours per day), which will hereafter be referred to as the analysis period.

Annual Solar Exposure Plot: ASE plots show the annual number of hours illuminance values in a space are expected to exceed 1000 foot-candles during the year. Areas that exceed 250 hours per year are considered over-lit. Grids are shown green if the total annual hours are less than 250 and red if the annual hours are greater than 250. The ASE plot is analyzed at a 2 square foot interval.



First Floor Opaque Panels

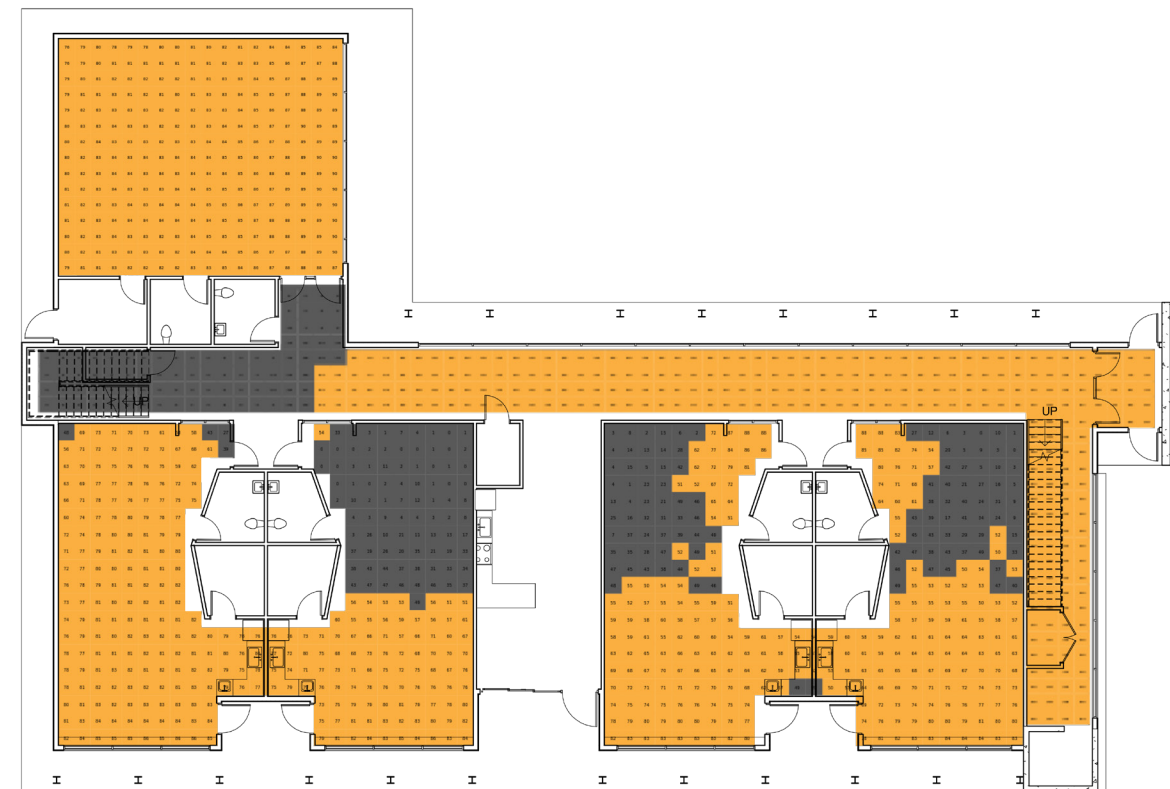
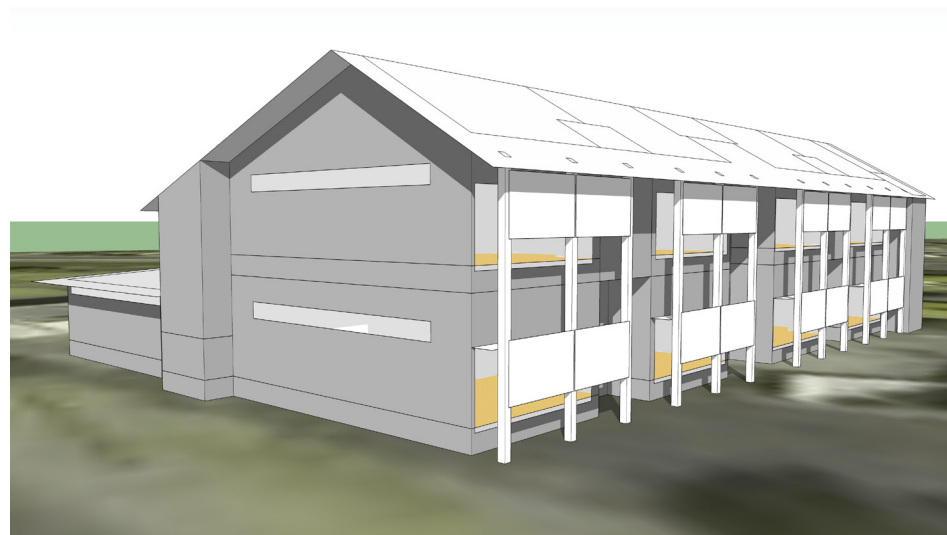
Regularly Occupied Space Averages

SDA: 81.53%

ASE: 4.25%

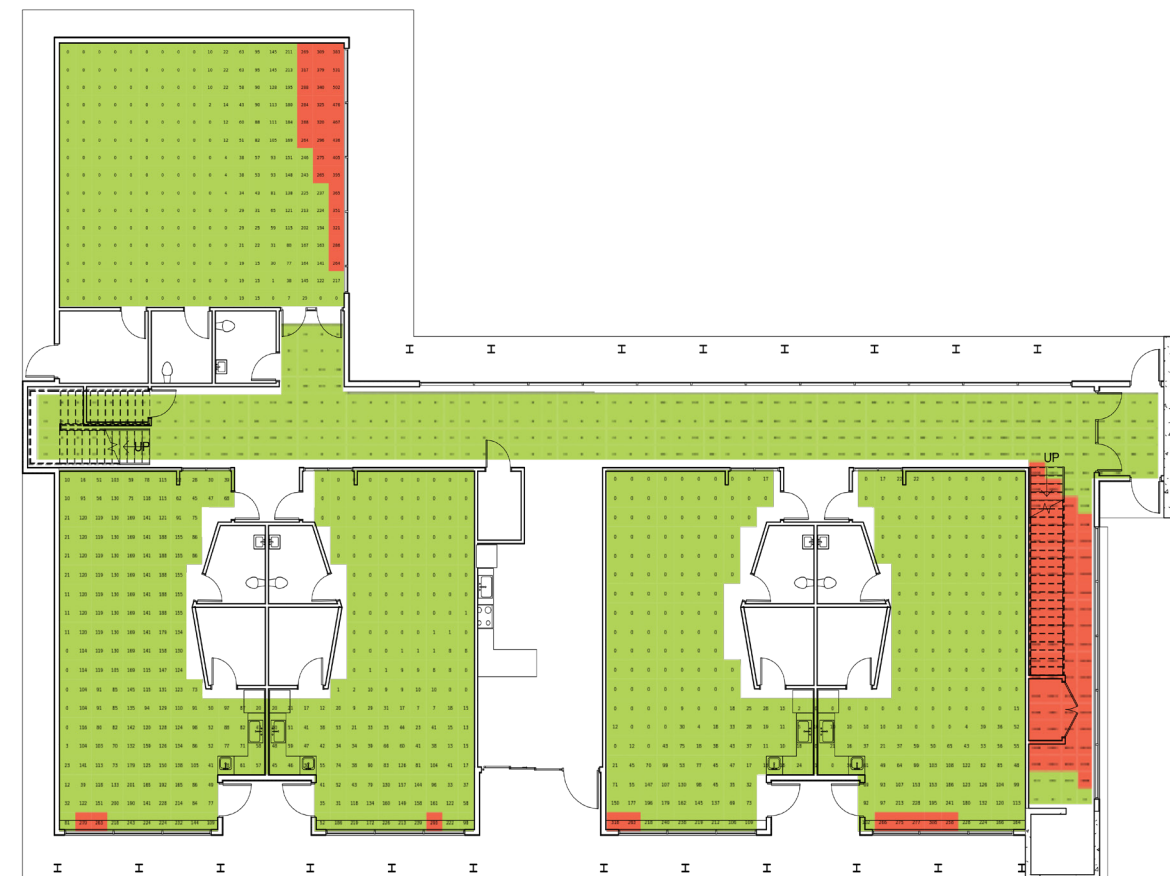
Recommendations

- Provide additional shade at east circulation
- Provide additional shade at east side of north classroom



Percent of annual hrs
with useable light levels

KEY: 0% 50%



Total annual hours
exceeding 1000 fc

KEY: 0 hr 250 hr

Second Floor Opaque Panels

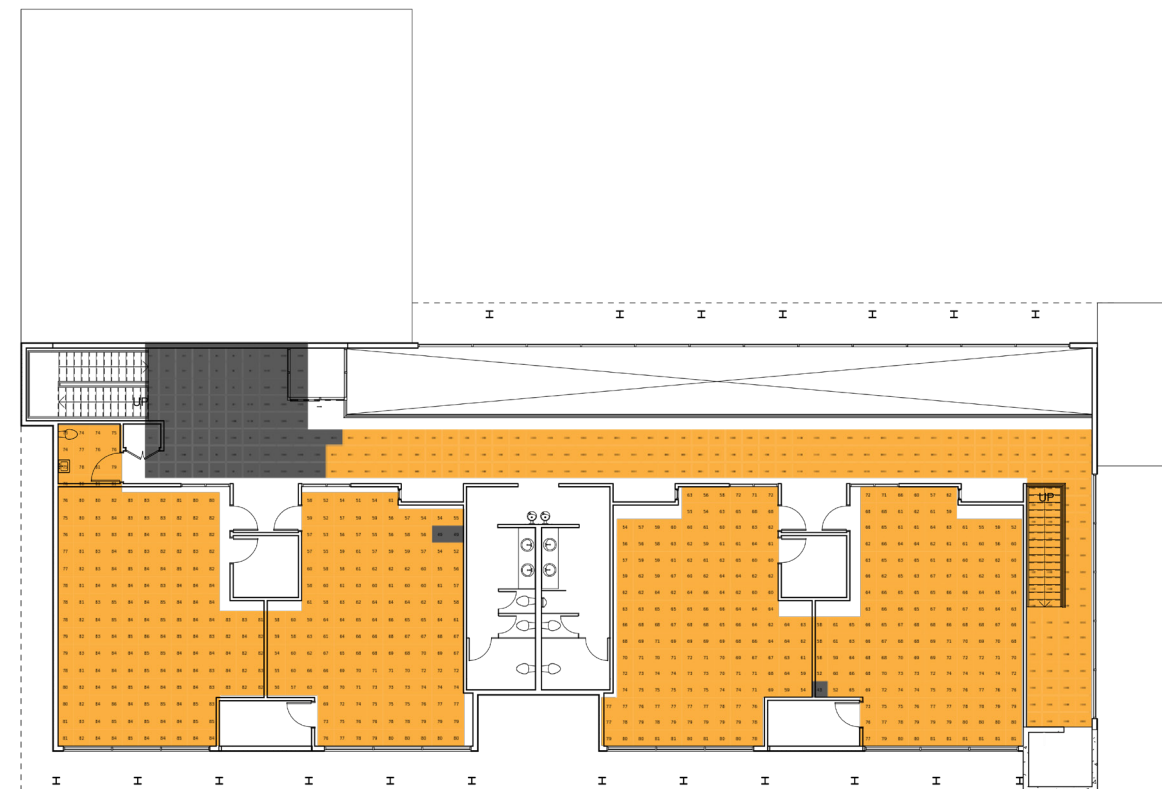
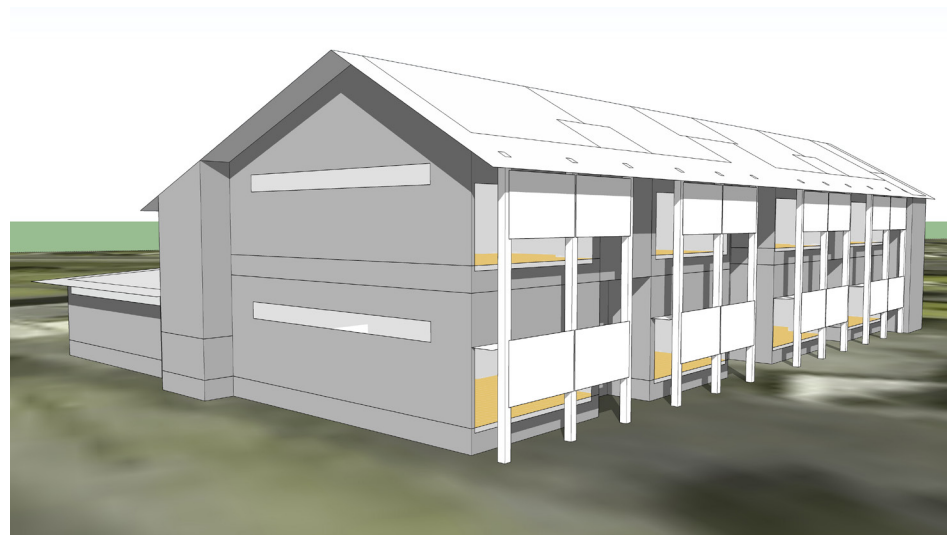
Regularly Occupied Space Averages

SDA: 99.55%

ASE: 0.00%

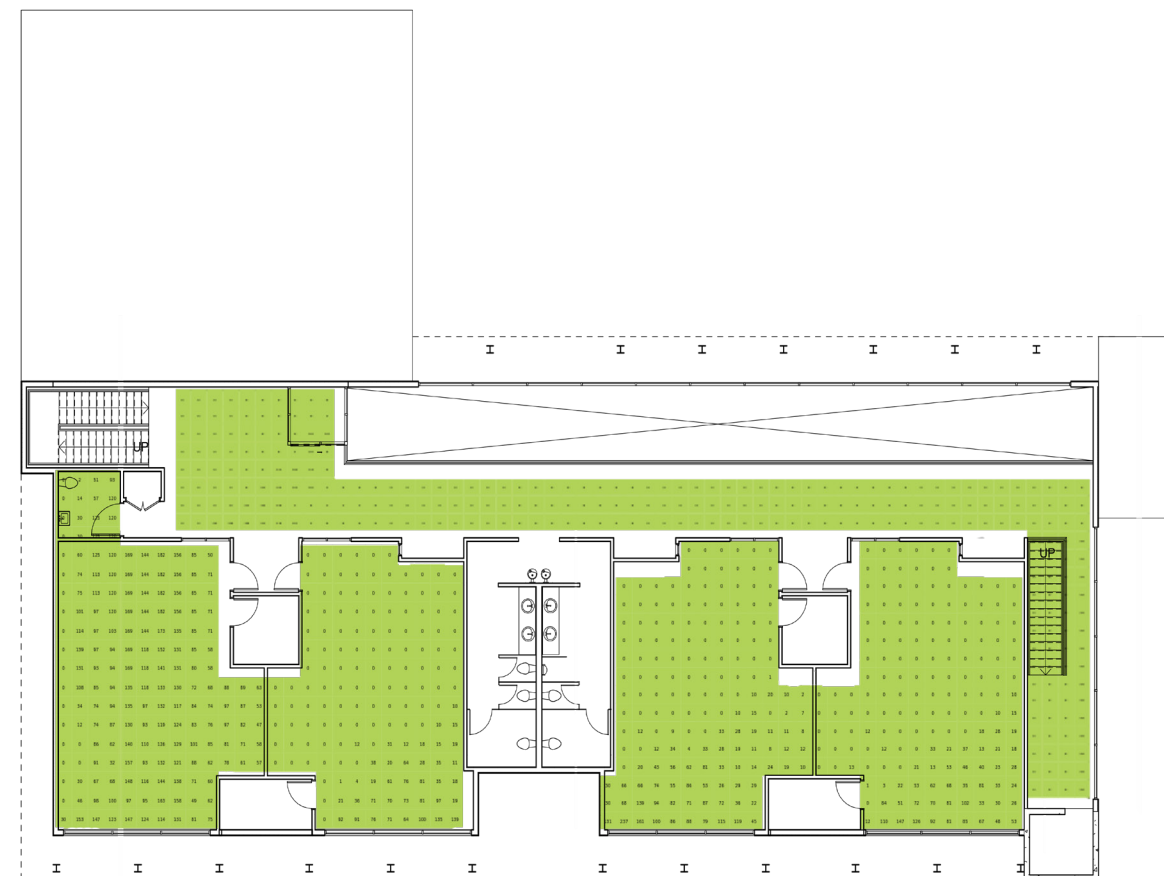
Recommendations

- Scenario is performing well in both metrics
- Clerestory glazing above north classroom may improve circulation light availability



Percent of annual hrs
with useable light levels

KEY: 0% 50%



Total annual hours
exceeding 1000 fc

KEY: 0 hr 250 hr

First Floor 25% Open Panels

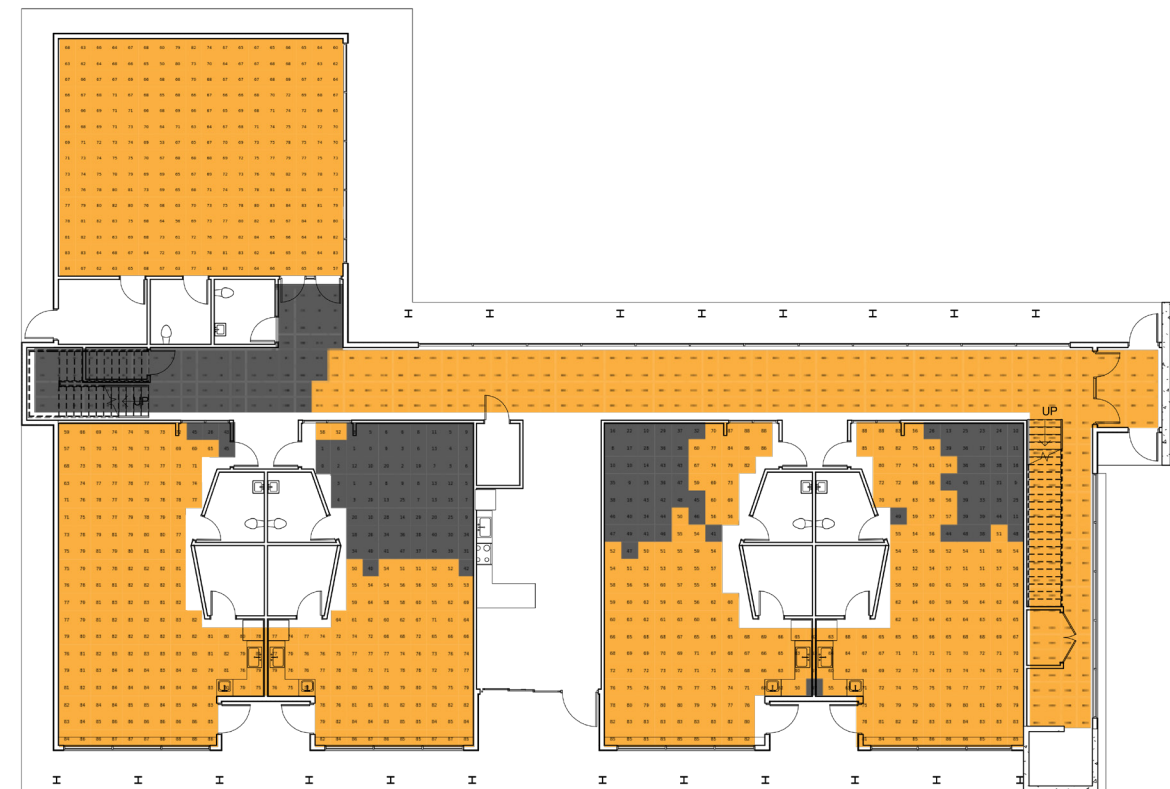
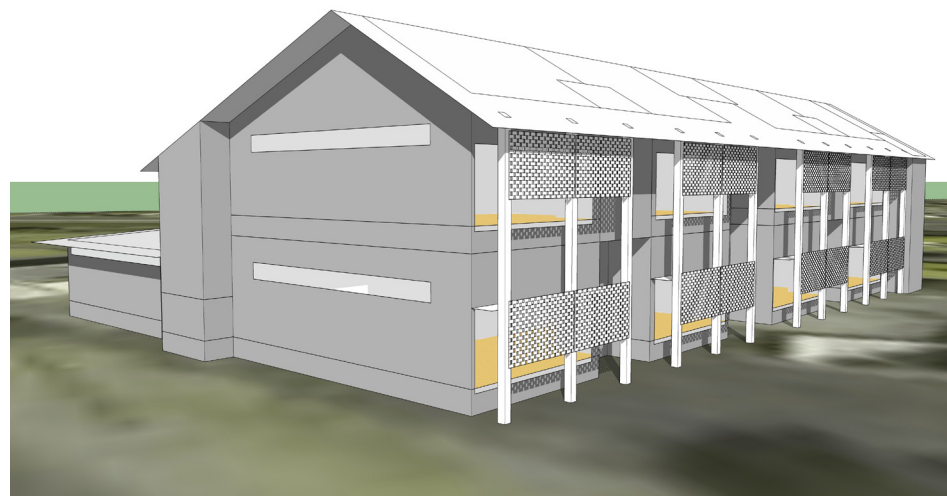
Regularly Occupied Space Averages

SDA: 87.41%

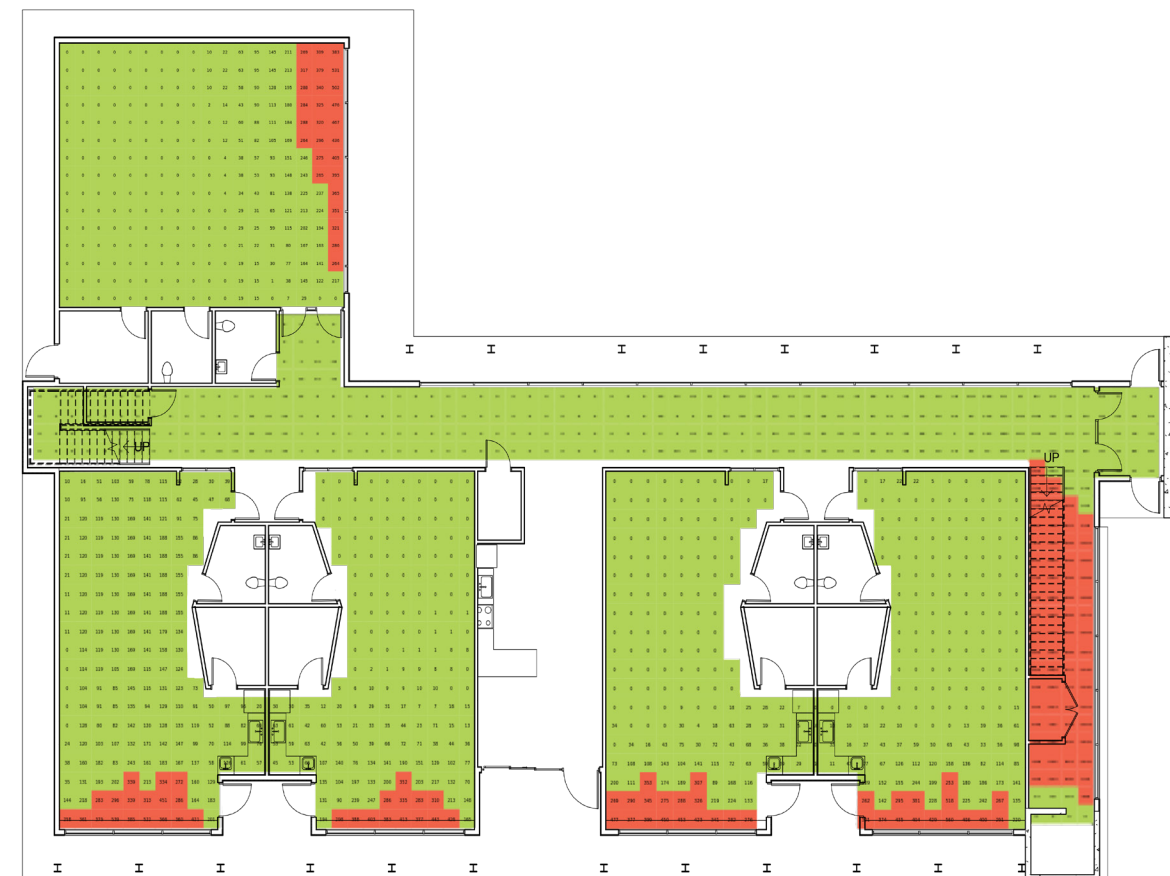
ASE: 9.08%

Recommendations

- Provide additional shade at east facade
- Provide additional shade at east side of north classroom
- Additional shading at south glazing



Percent of annual hrs
with useable light levels
KEY: 0% 50%



Total annual hours
exceeding 1000 fc
KEY: 0 hr 250 hr

Second Floor 25% Open Panels

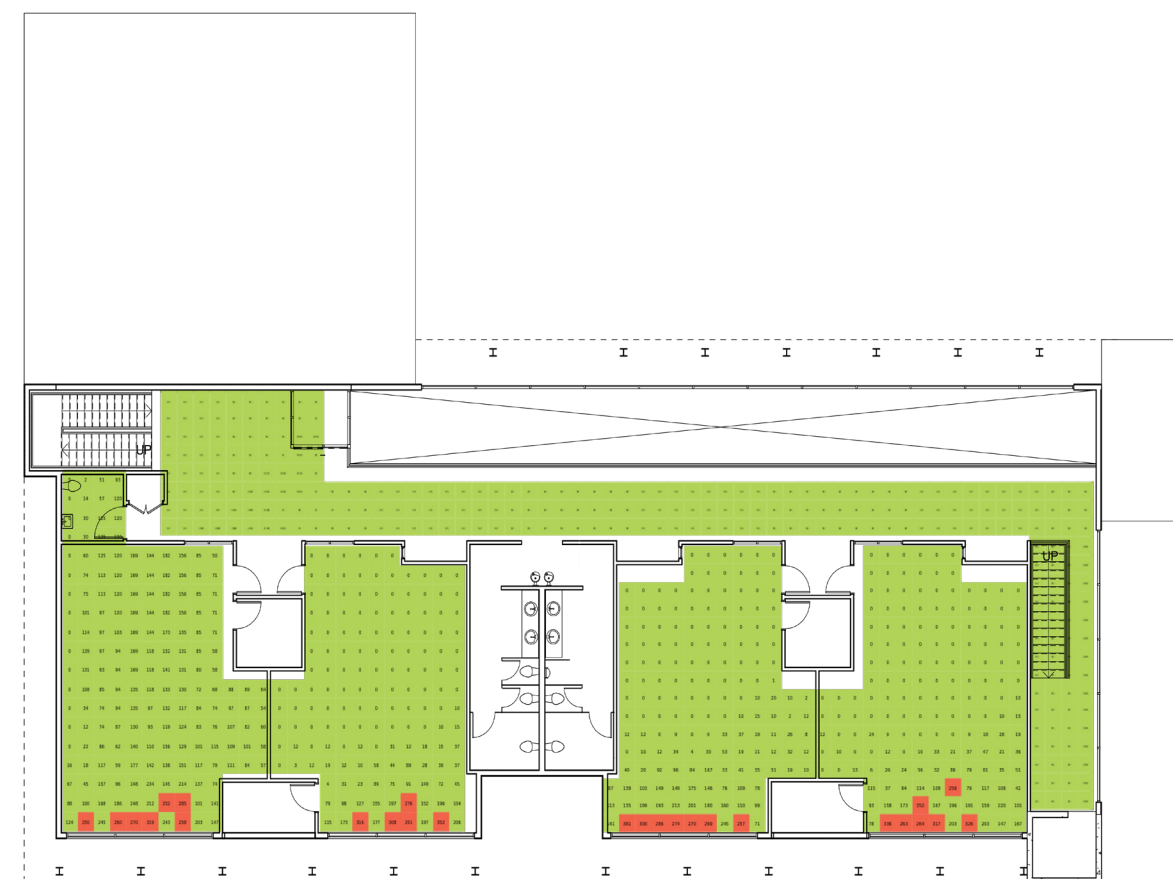
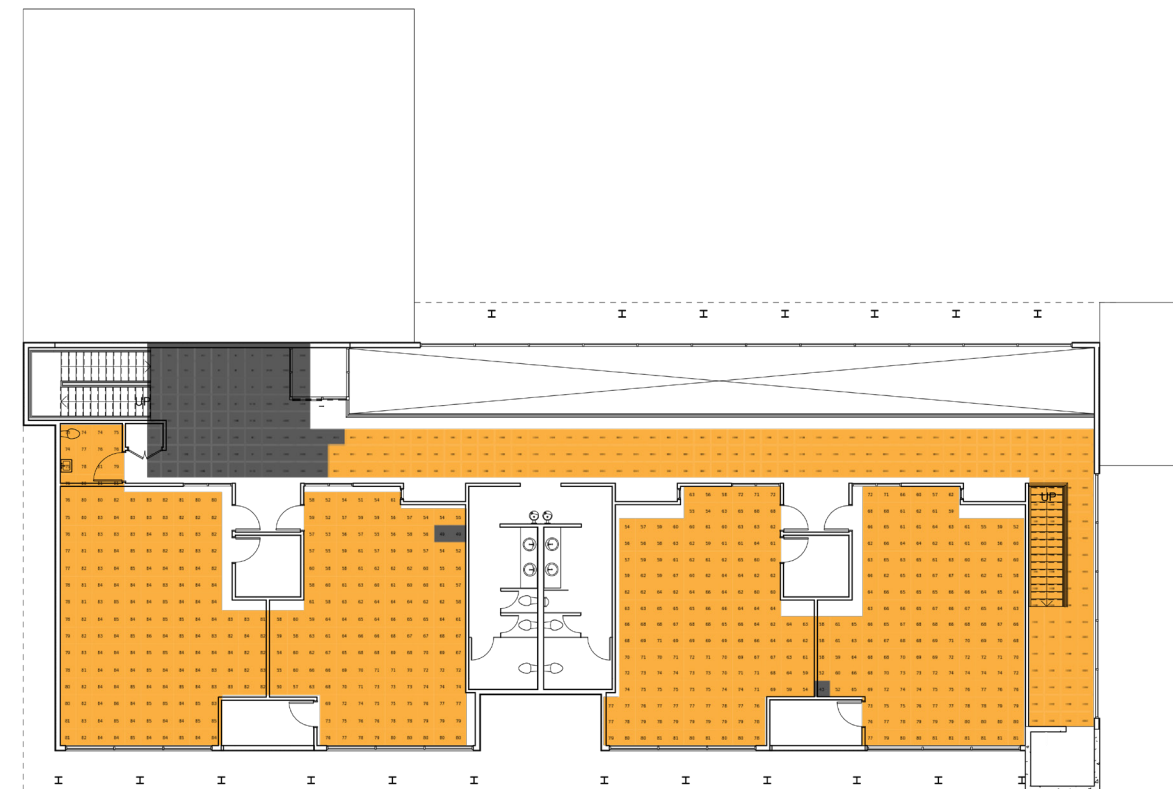
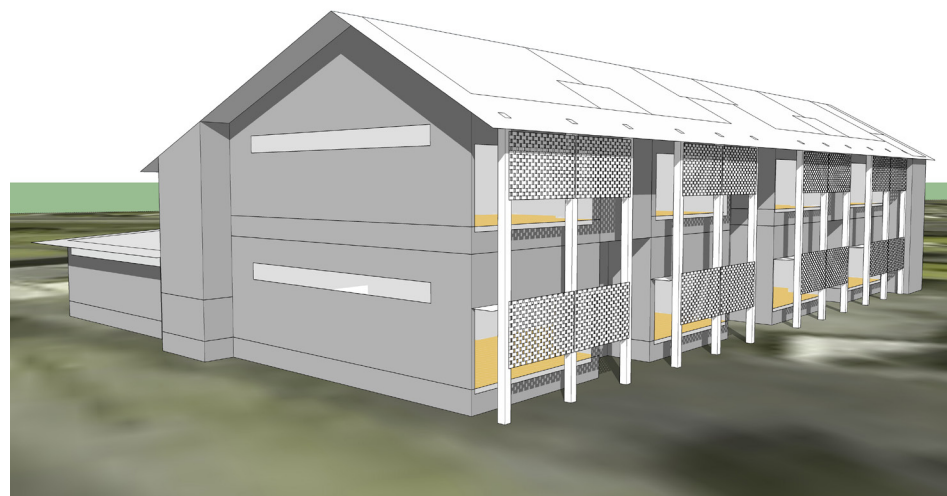
Regularly Occupied Space Averages

SDA: 100.00%

ASE: 3.93%

Recommendations

- Scenario is performing well in both metrics
- Clerestory glazing above north classroom may improve circulation light availability



First Floor 50% Open Panels

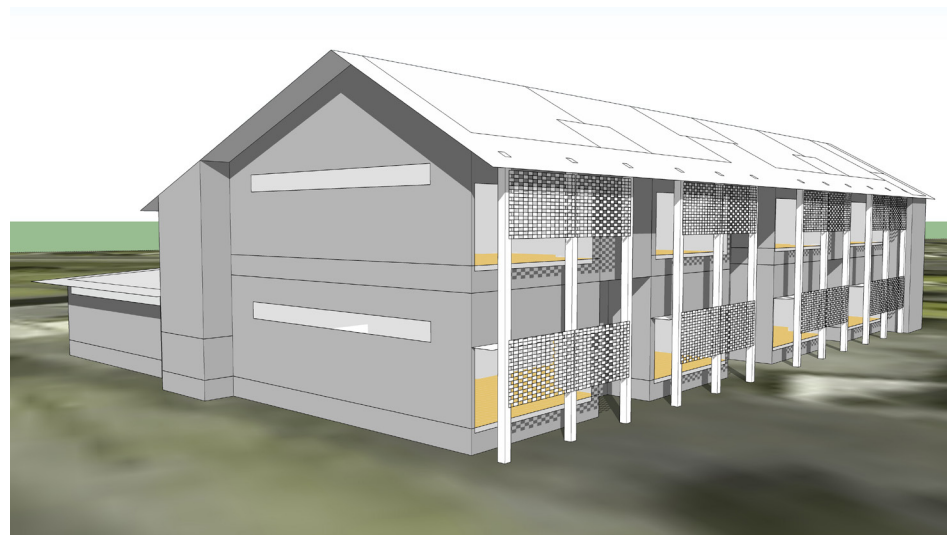
Regularly Occupied Space Averages

SDA: 90.59%

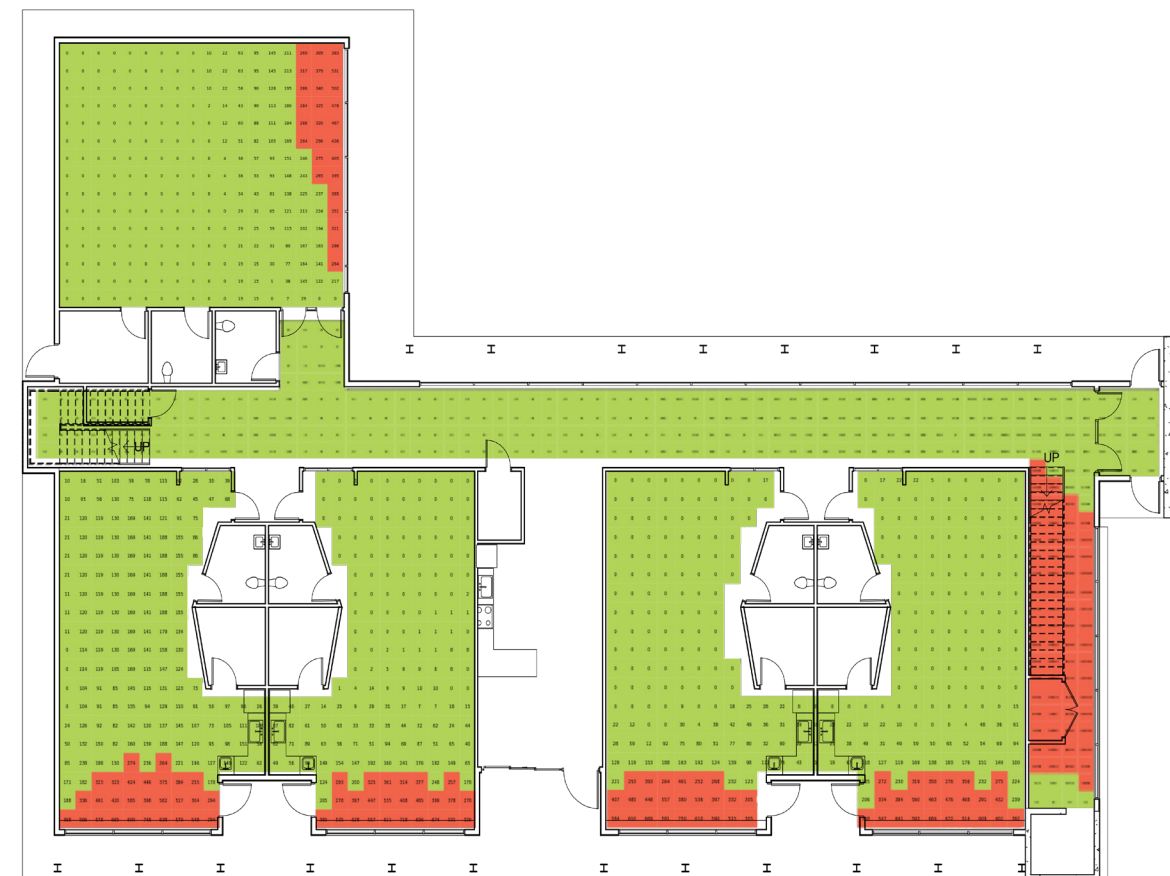
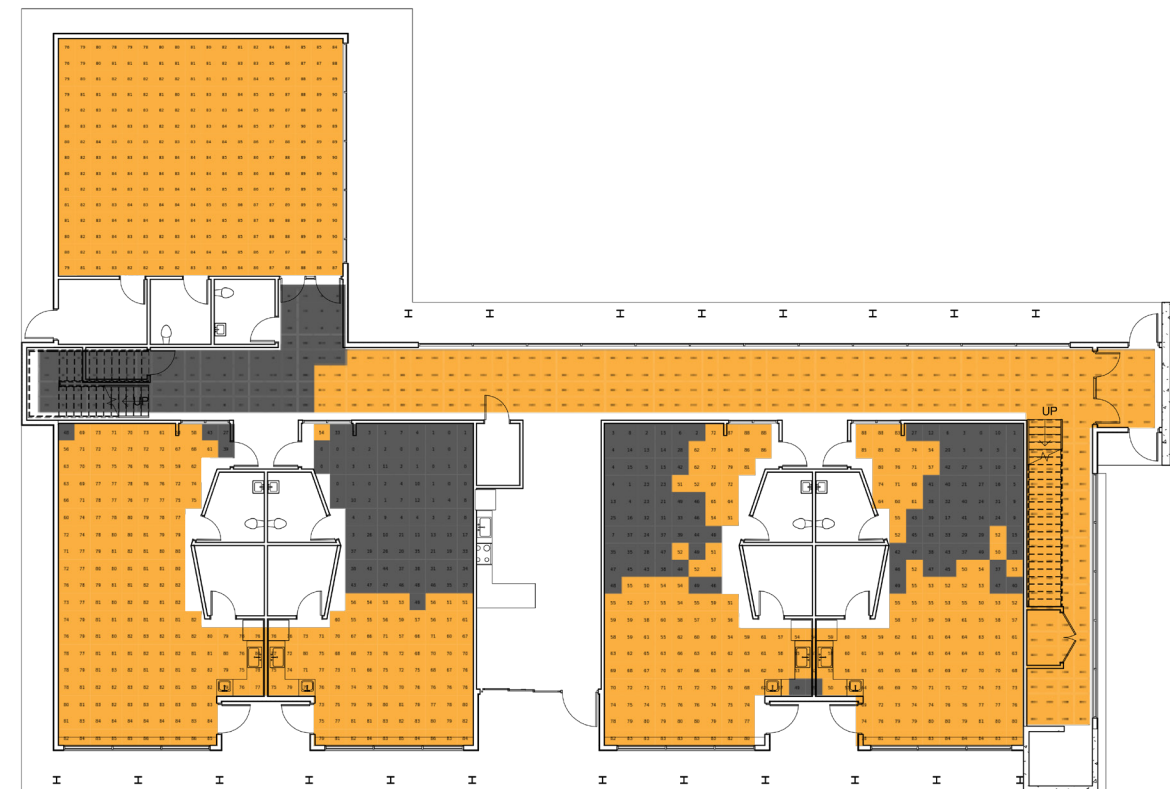
ASE: 12.52%

Recommendations

- Provide additional shade at east facade
- Provide additional shade at south facade



TOC



Second Floor 50% Open Panels

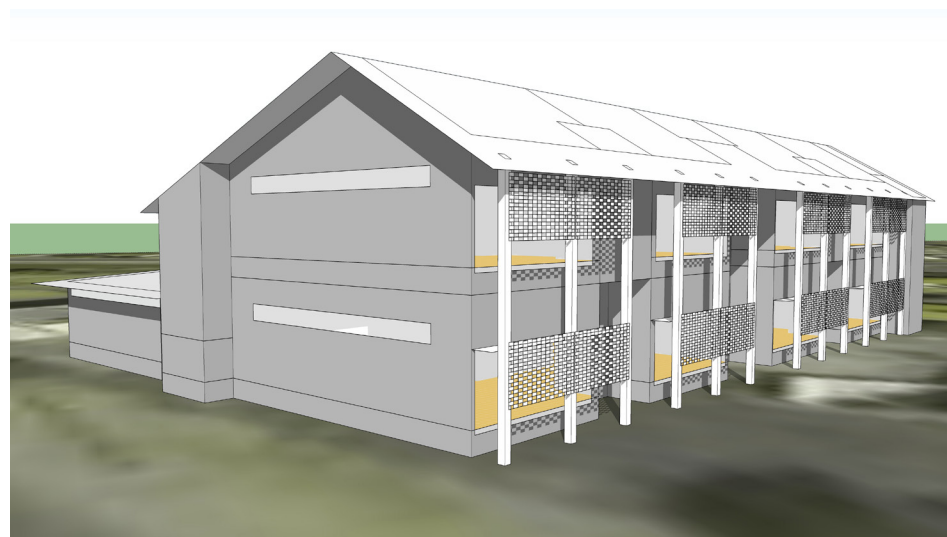
Regularly Occupied Space Averages

SDA: 100.00%

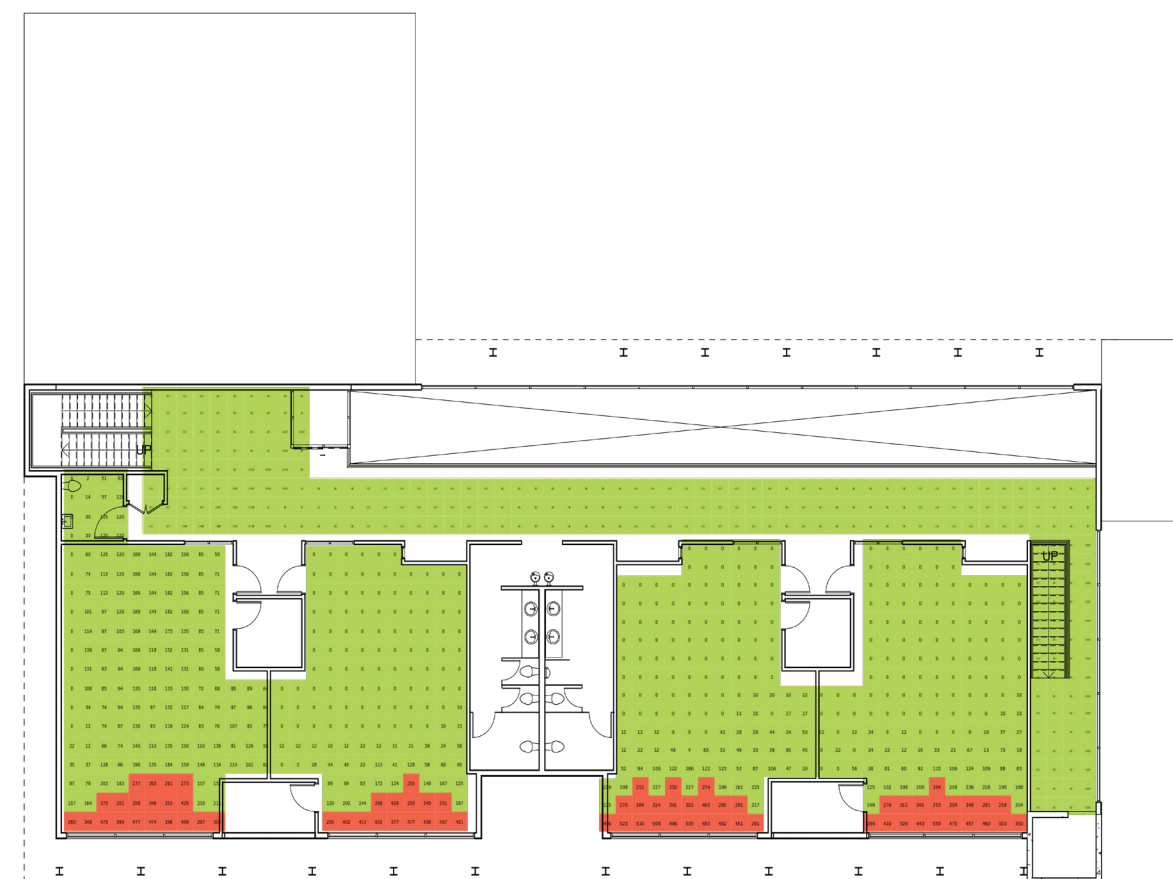
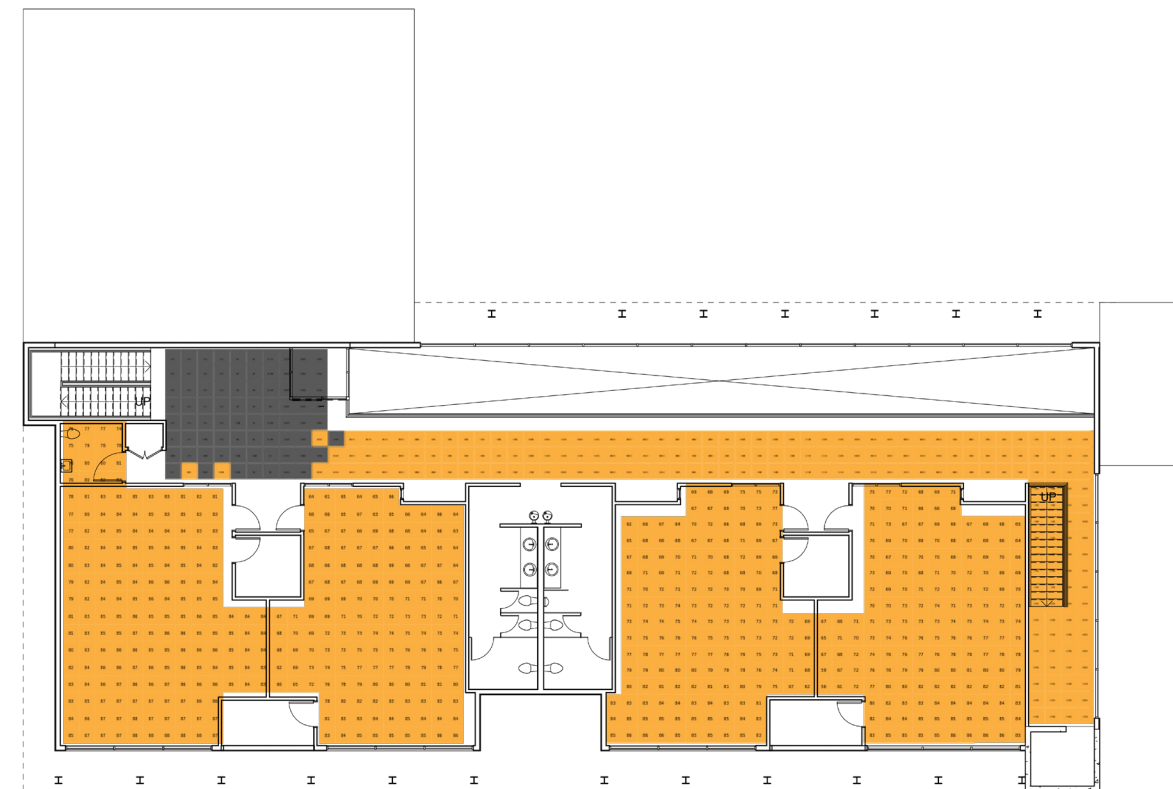
ASE: 11.92%

Recommendations

- Additional shading at south glazing
- Clerestory glazing above north classroom may improve circulation light availability



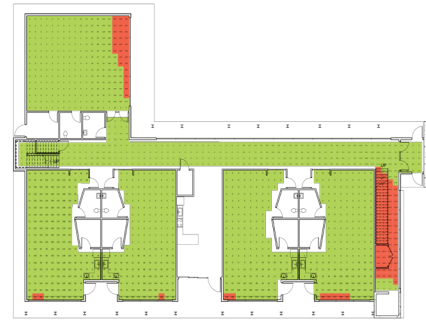
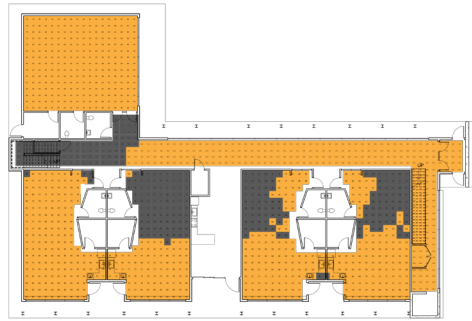
TOC



Opaque

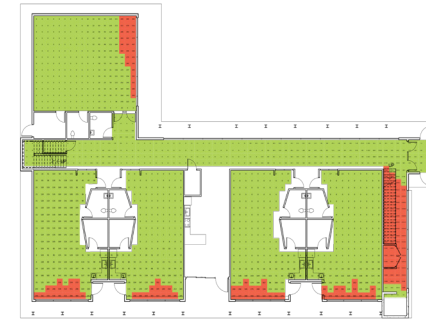
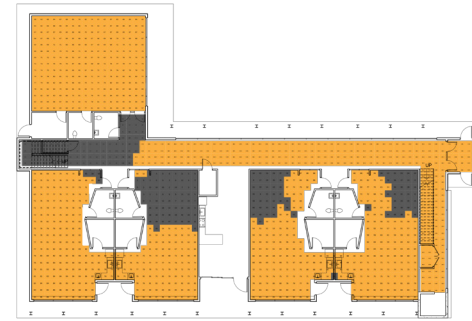
25% Panels

50% Panels



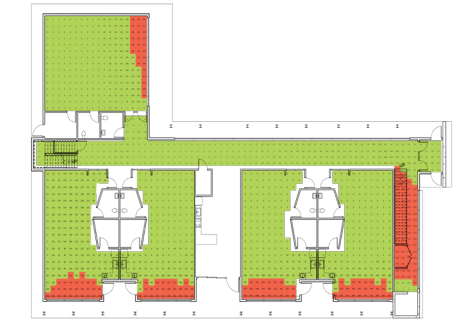
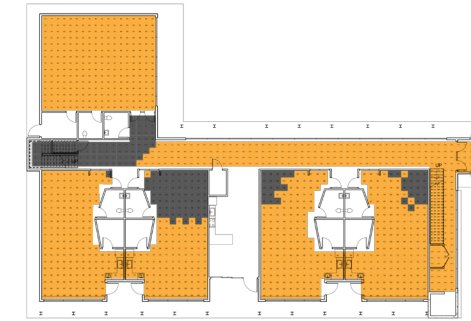
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ASE: 4.25%



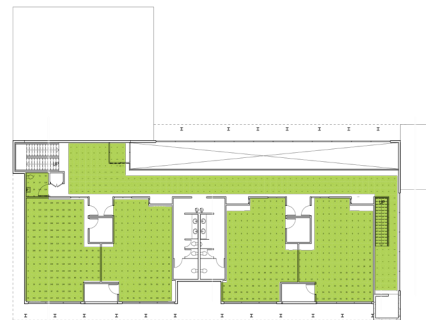
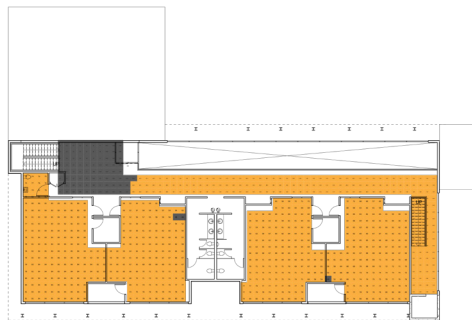
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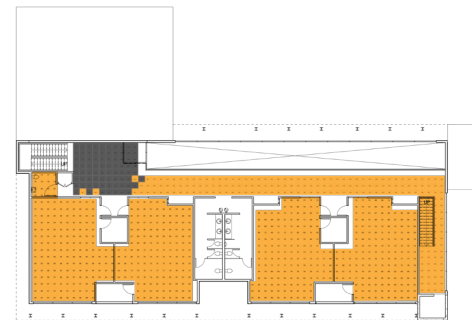
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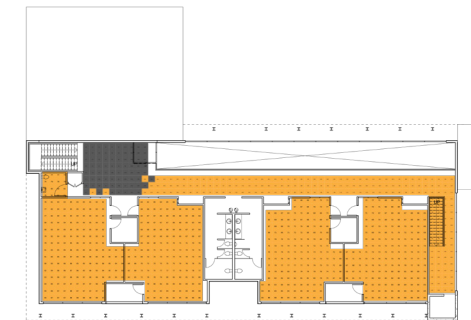
SDA: 99.55%

ASE: 0.00%



SDA: 100.0%

ASE: 3.93%



SDA: 100.0%

ASE: 11.32%

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