NET ZERO EMERGING LEADER INTERNSHIP

SALAZAR ARCHITECT INC | ENERGY TRUST OF OREGON

2022

Nasrin Golshany

Dorian McCall

SALAZARCHITECT inc

Successful Strategies and Design Processes that Impact Occupants and Building Operations

Interns

Nasrin Golshany
Nasring@uoregon.edu

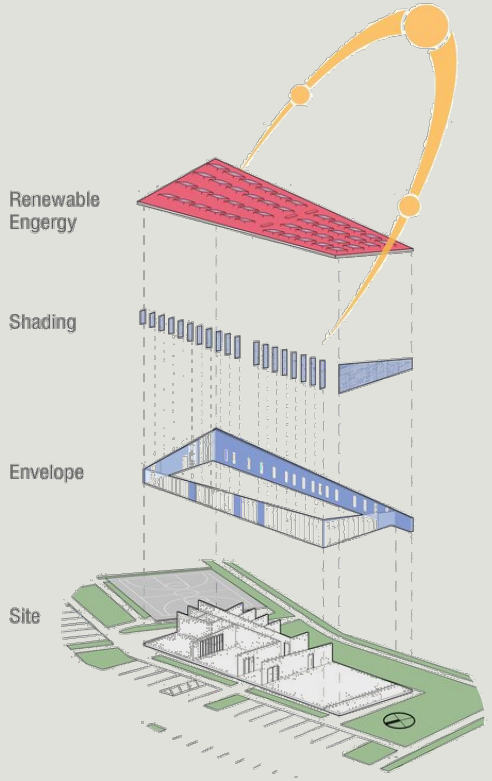
Ph.D. Candidate
School of Architecture and Environment
University of Oregon

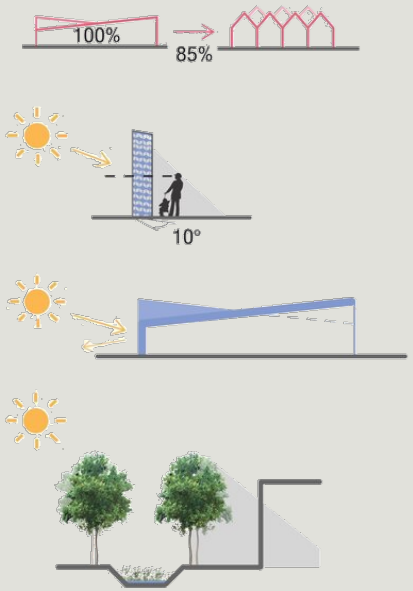
Dorian McCall
dmccall@uoregon.edu

Masters of Architecture &
Historical Preservation
School of Architecture and Environment
University of Oregon

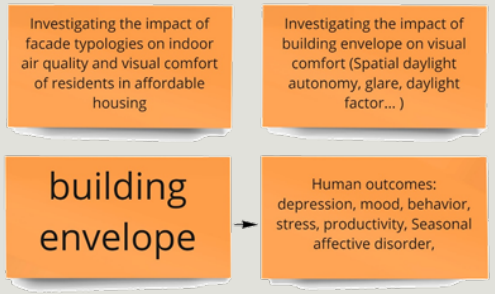
Introduction

Salazar Architect Inc. was proud to become a signatory of the AIA 2030 Commitment in 2019, the same year that Salazar first submitted the energy modeling portfolio to the DDx platform.

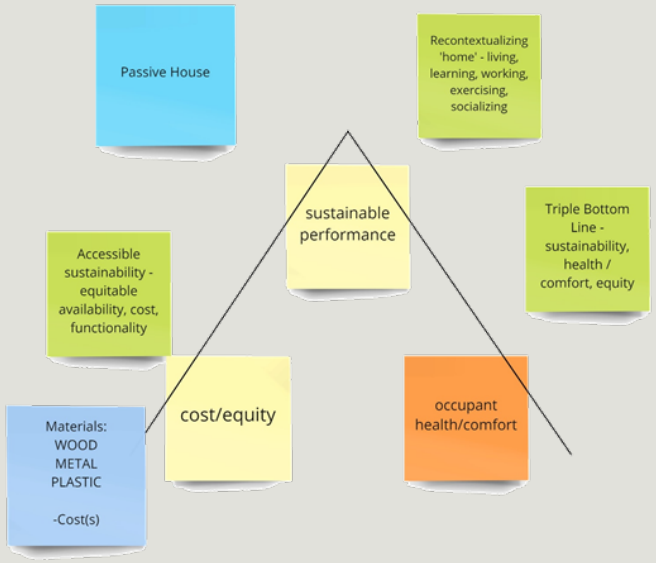


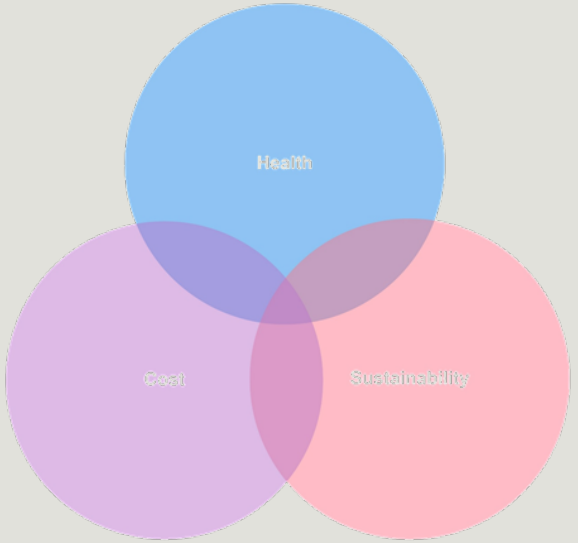


Research Background



1. Research envelope + systems strategies (Passive House, current Salazar projects, etc)
    a. assemblies, details of these strategies
2. How do the strategies above affect occupant health and behavior
3. What is an achievable middle ground that can be incorporated into affordable/equitable housing?





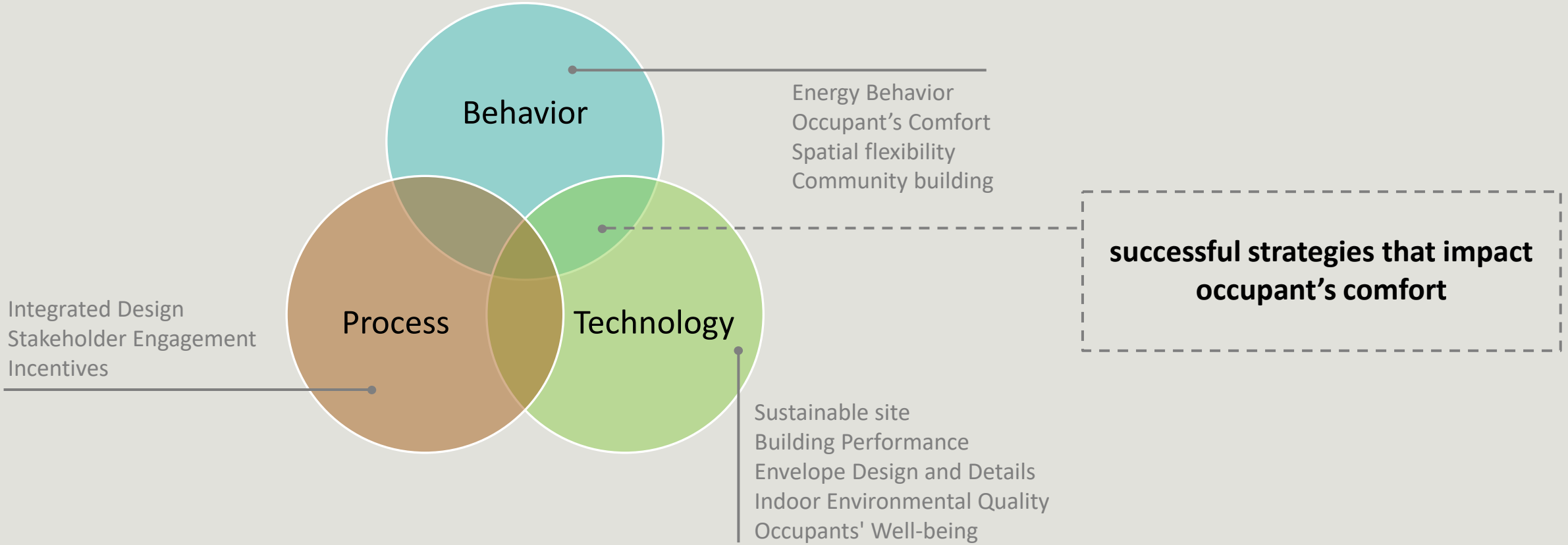
Parameters

1. Window position / orientation
2. Window to wall ratio
3. Materials
    a. ~~Frame~~
    b. Insulated glazing unit (IGU)
        i. SHGC
        ii. u-value
        iii. visual transmittance
4. Energy performance / EUI (COVE modeling)

Dependent Parameters

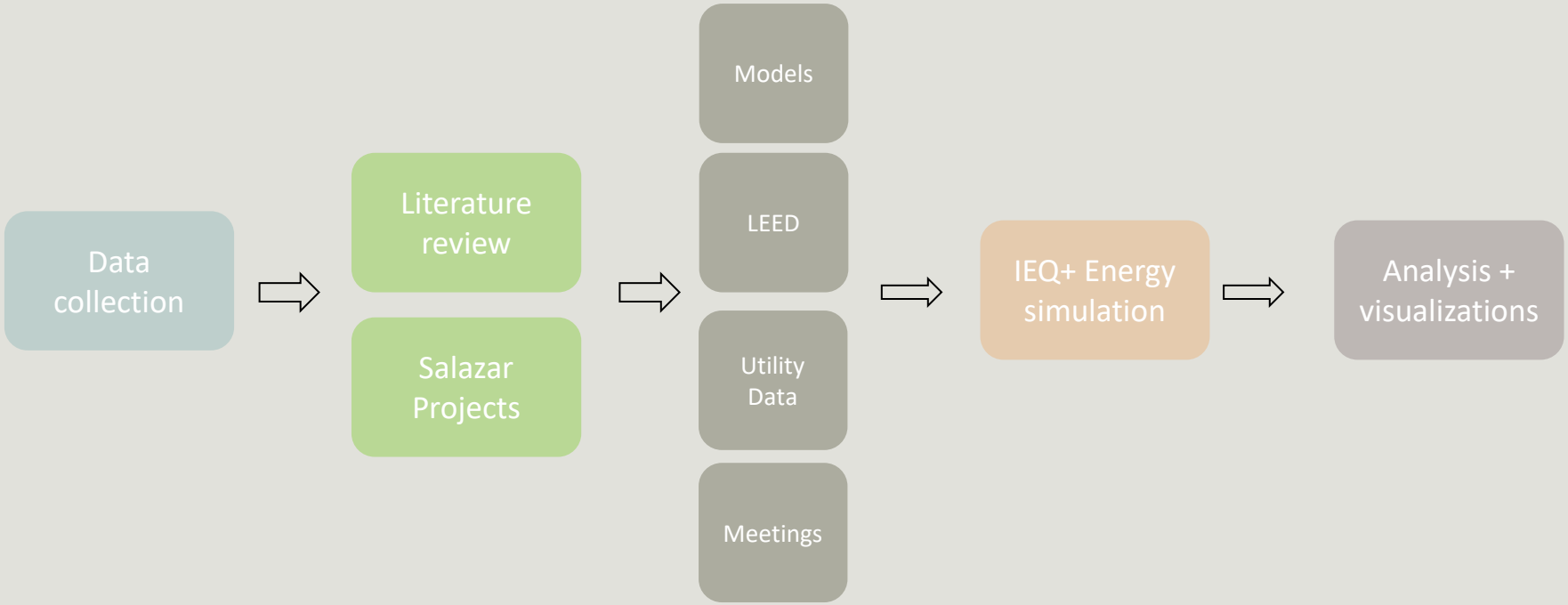
1. Visual comfort
2. Thermal comfort

Net Zero Building Definition



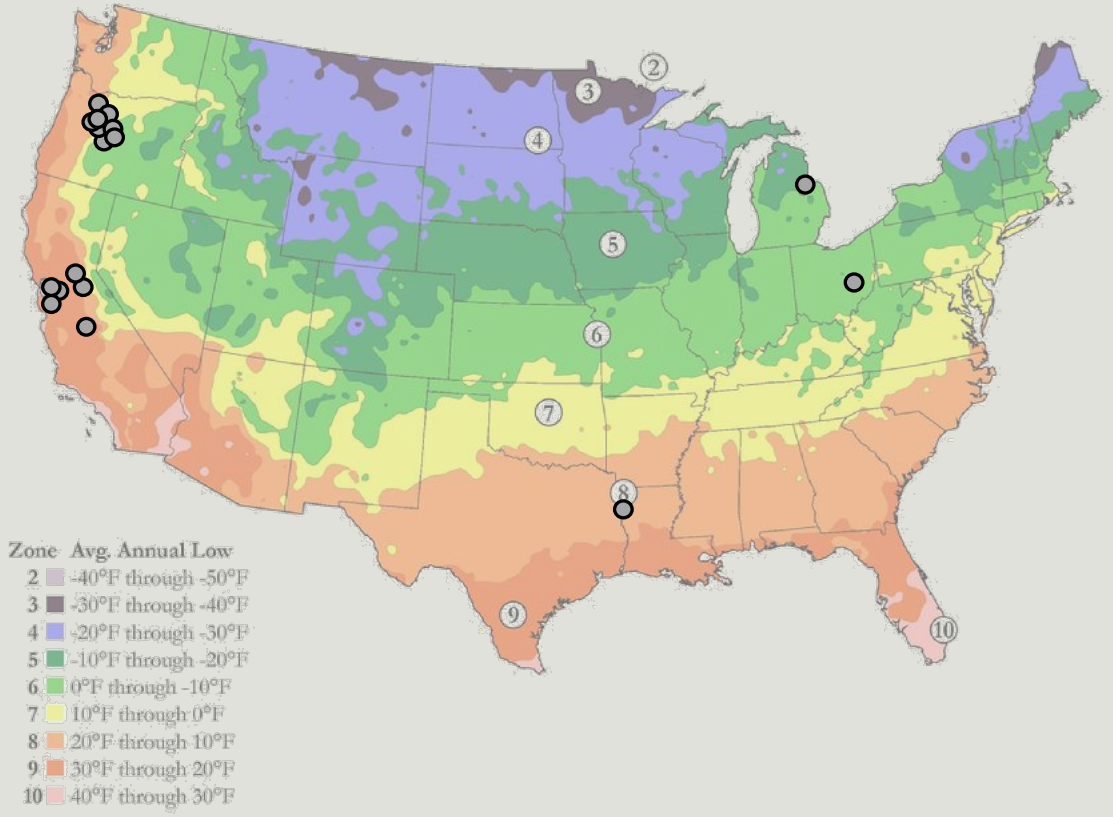
Methods And Research Work

Comparative Case Study + Simulations + Analysis



Project Data In Salazar Architect

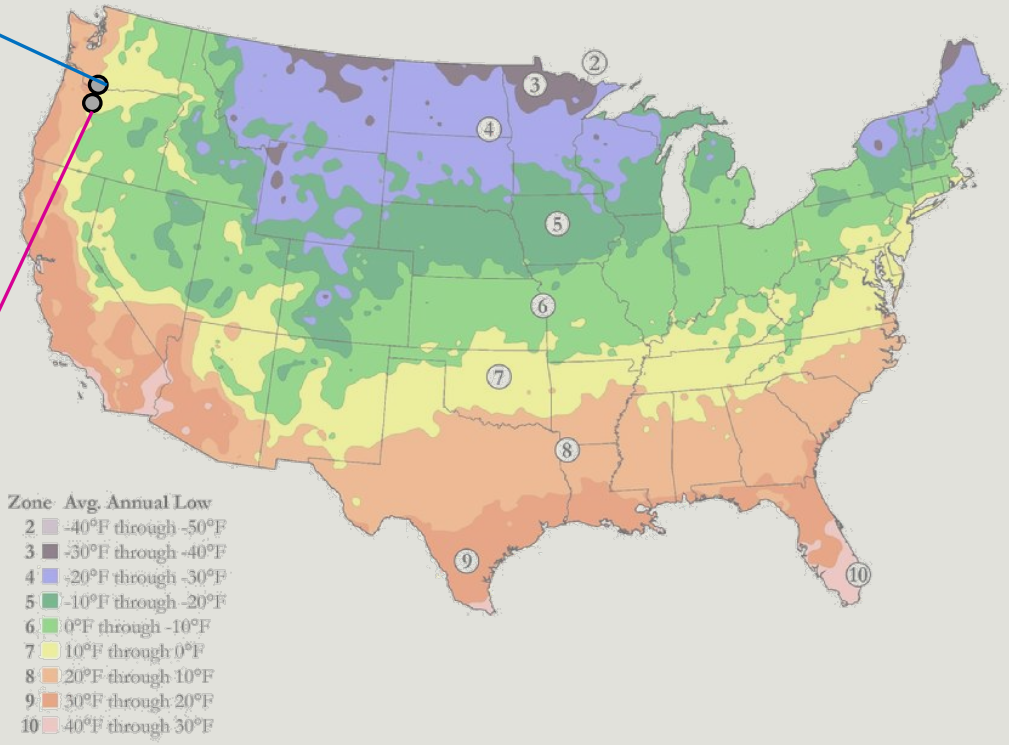
Affordable Housing



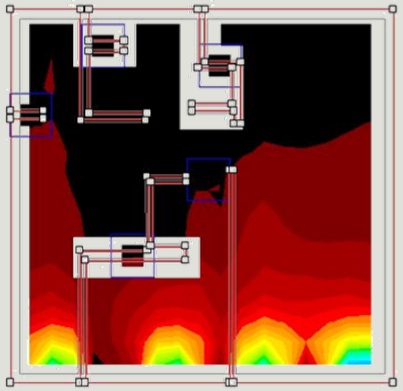
Comparative Analysis

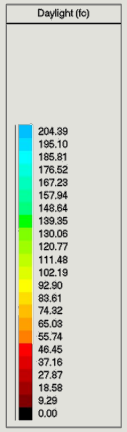
- Fourth Plain (Includes community commons, affordable public housing, public plaza, and community-serving commercial space)

- Las Adelitas (affordable and permanent supportive housing, event hall, and public plaza)

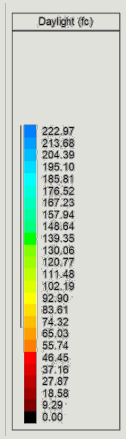


Las Adelitas Vs Fourth Plain (South Facing Units)

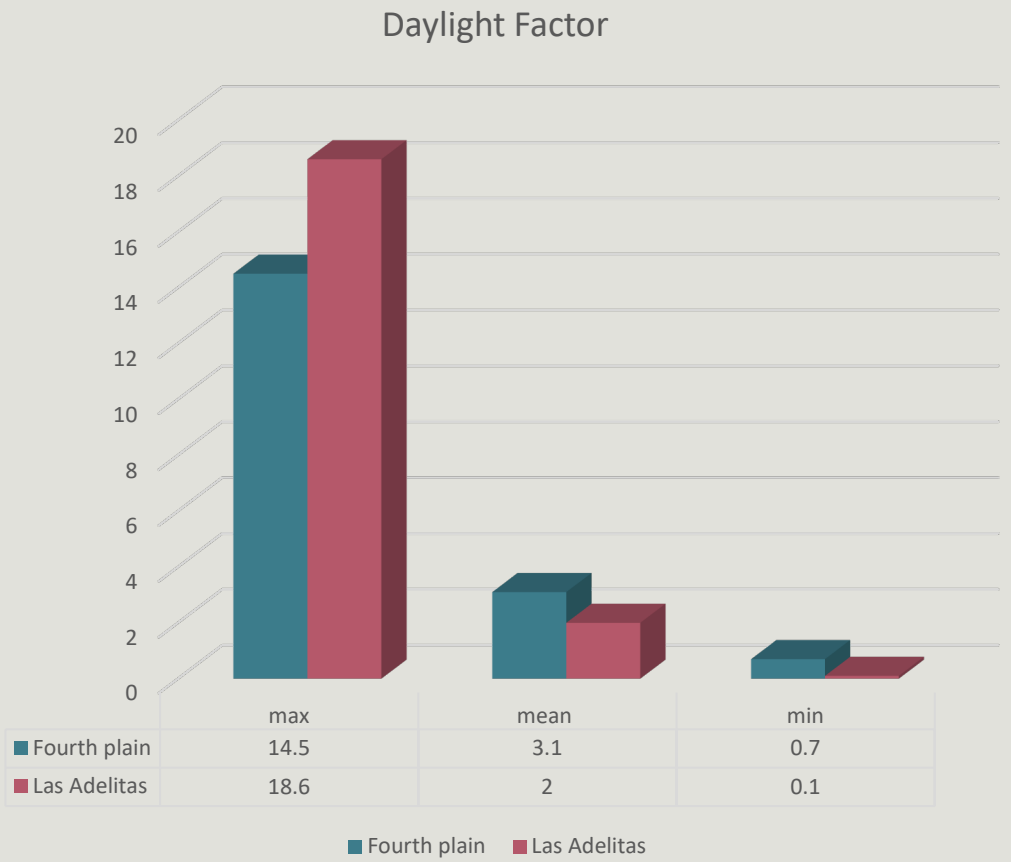




Las Adelitas



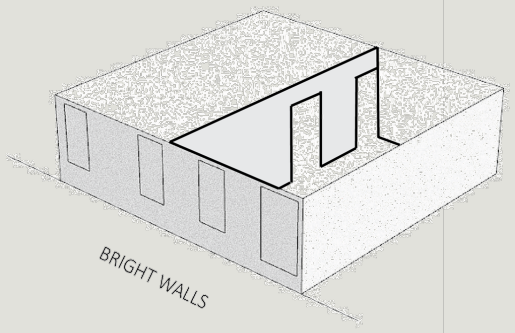
Fourth Plain



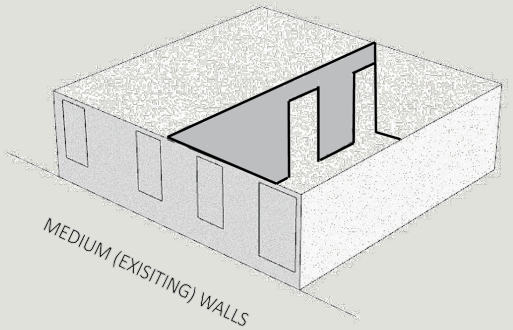
Proposed Solutions

Color

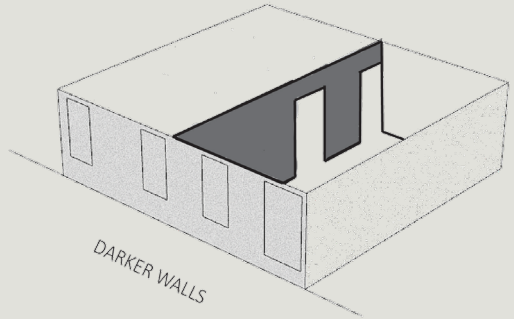
- Bright
- Medium (Existing)
- Dark



RV: 90%



RV: %60

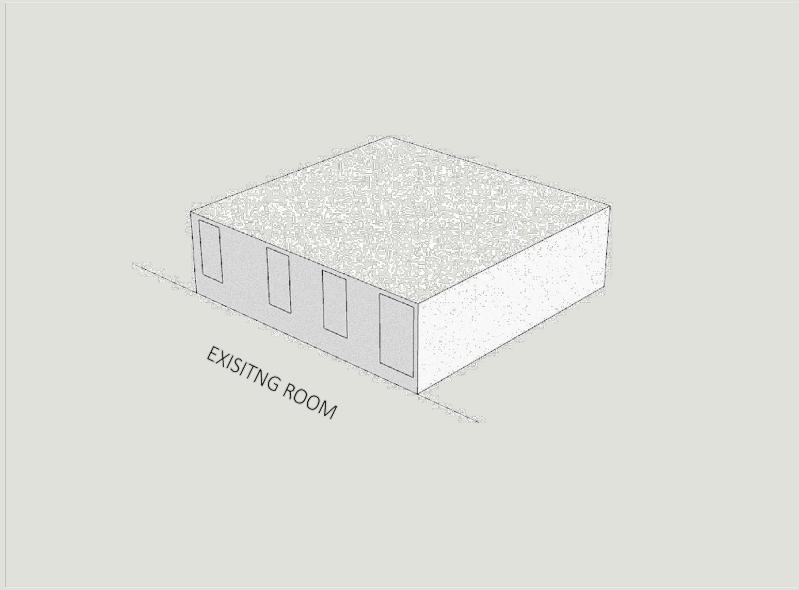


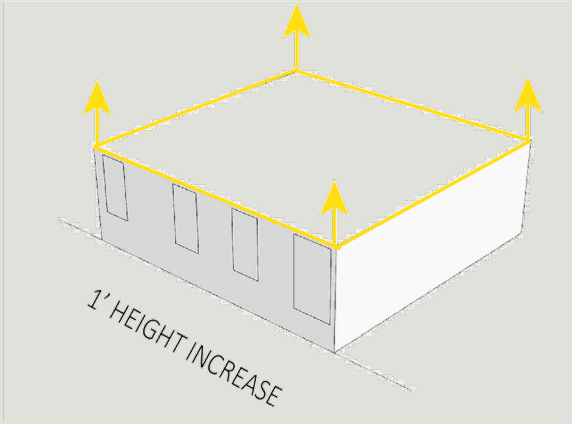
RV: %10

Proposed Solutions

Height

- Existing: 9’ Ceilings
- New Height: 10’ Ceilings

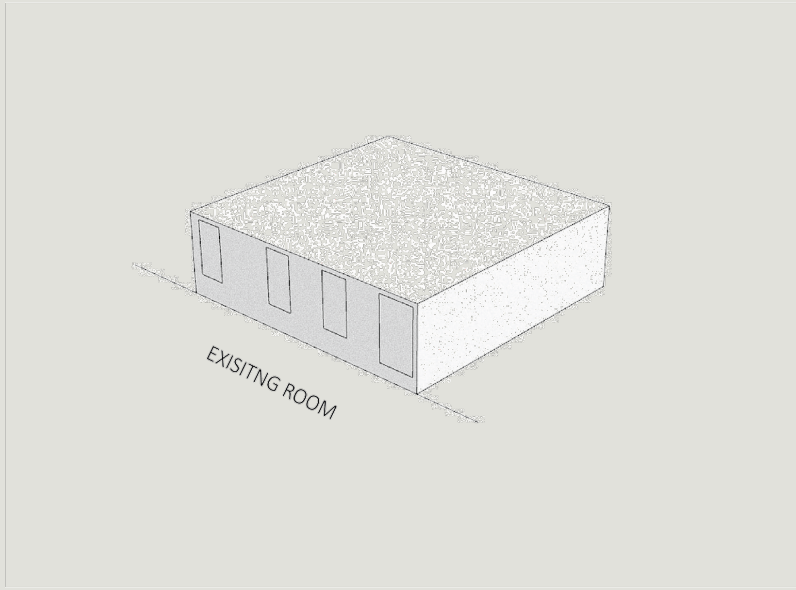


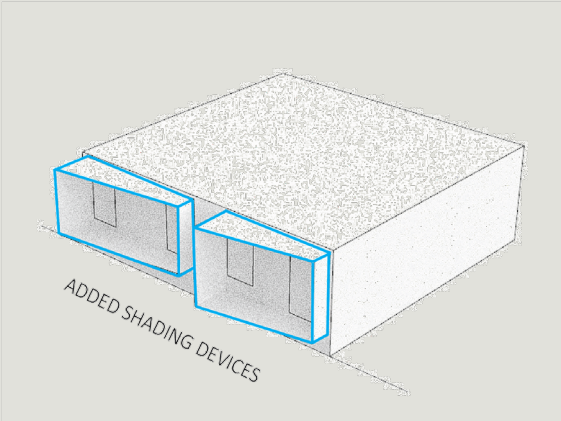


Proposed Solutions

Shading

- No Shading
- Added Shading

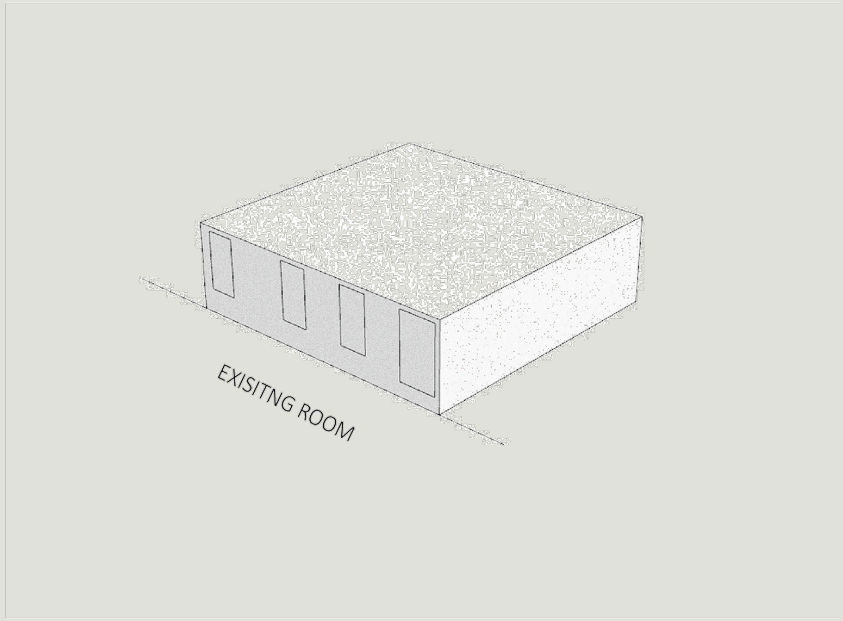




Proposed Solutions

Layout

- Existing
- New Layout



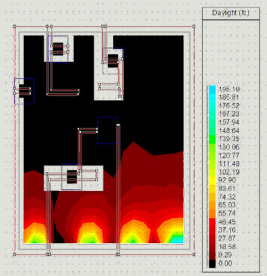
Occupants And Building Operation Variables

- Daylight glare probability (living rooms/ south rooms)
- Daylight performance (Spatial daylight autonomy, useful daylight illumination)
- Annual solar exposure

Illuminance

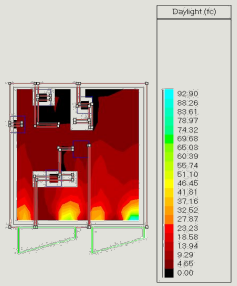
Existing

Bright

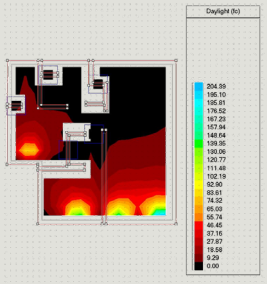


Dark

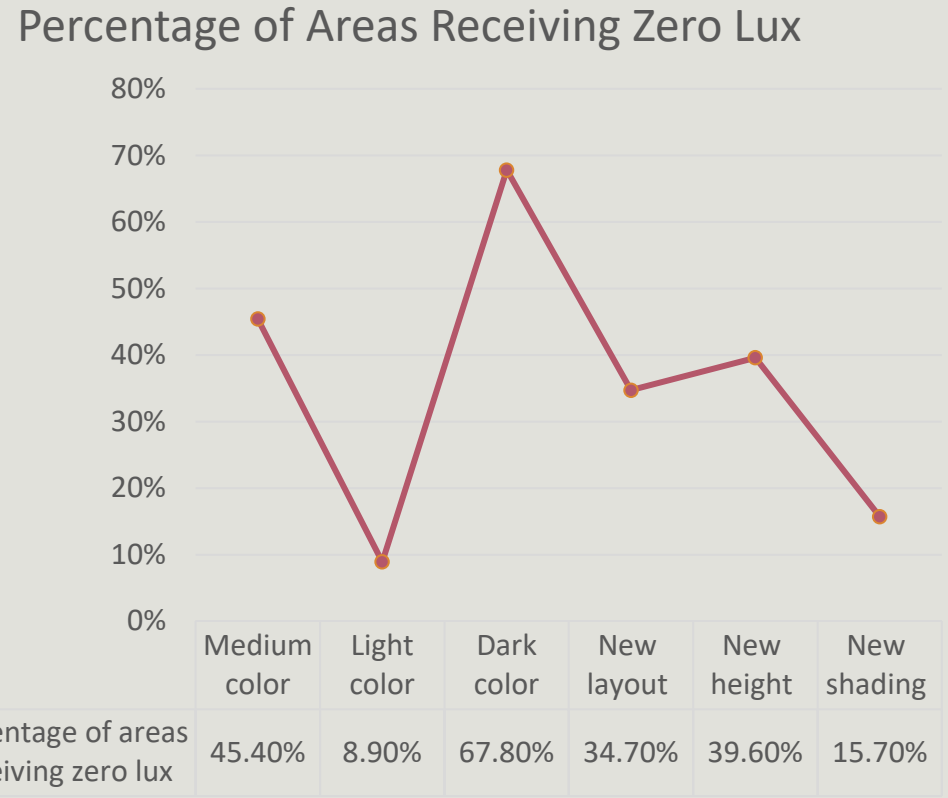
New Height



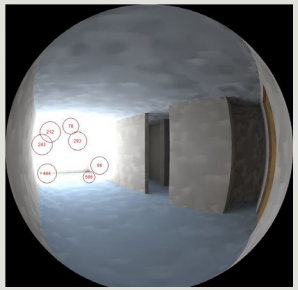
New shading



New Layout



Luminance



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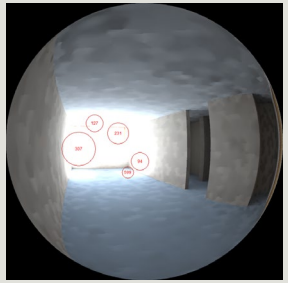

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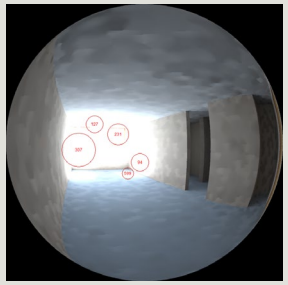
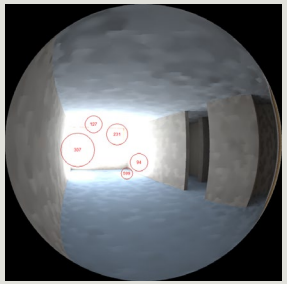
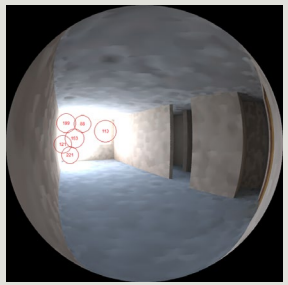


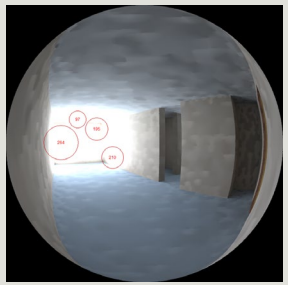
Dark



New Height



New shading



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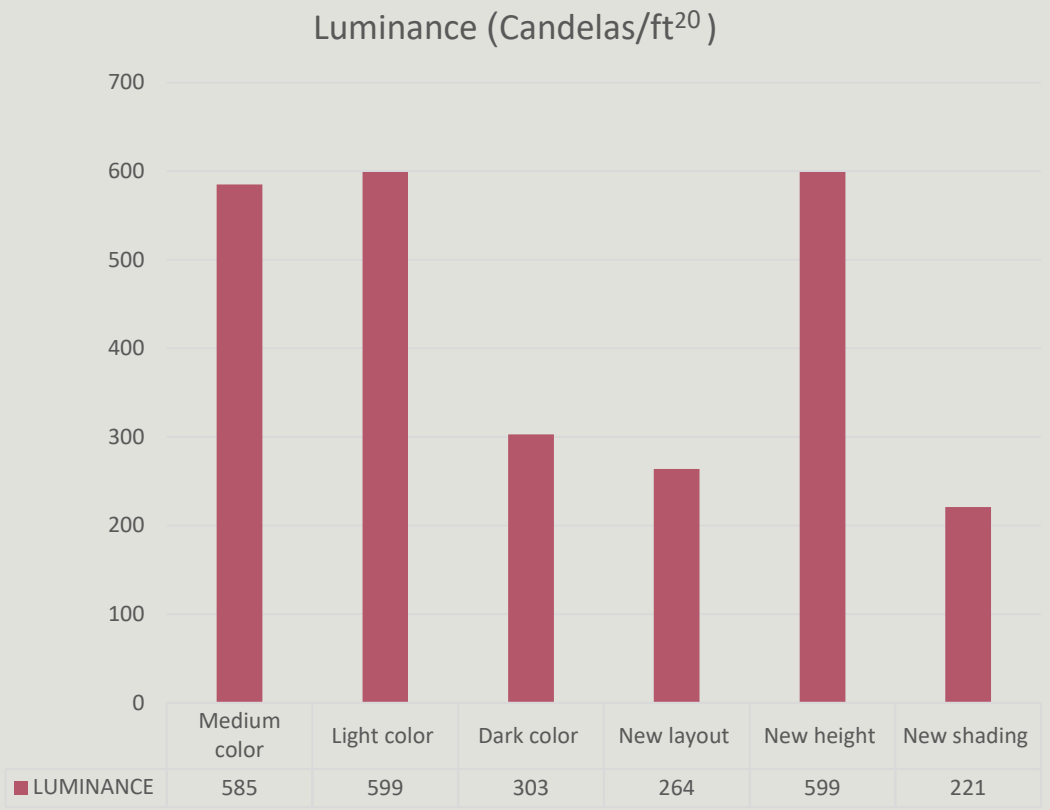
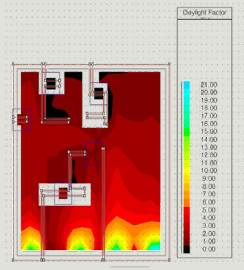


Daylight Factor (DF)

Existing



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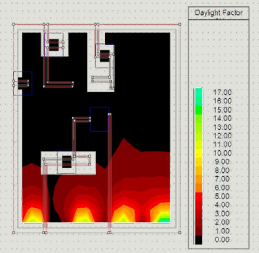
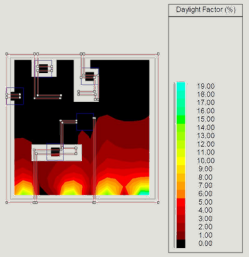


Dark



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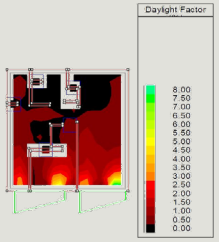

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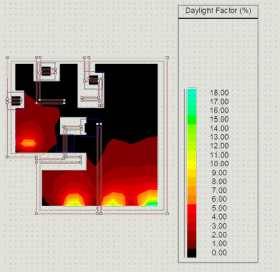

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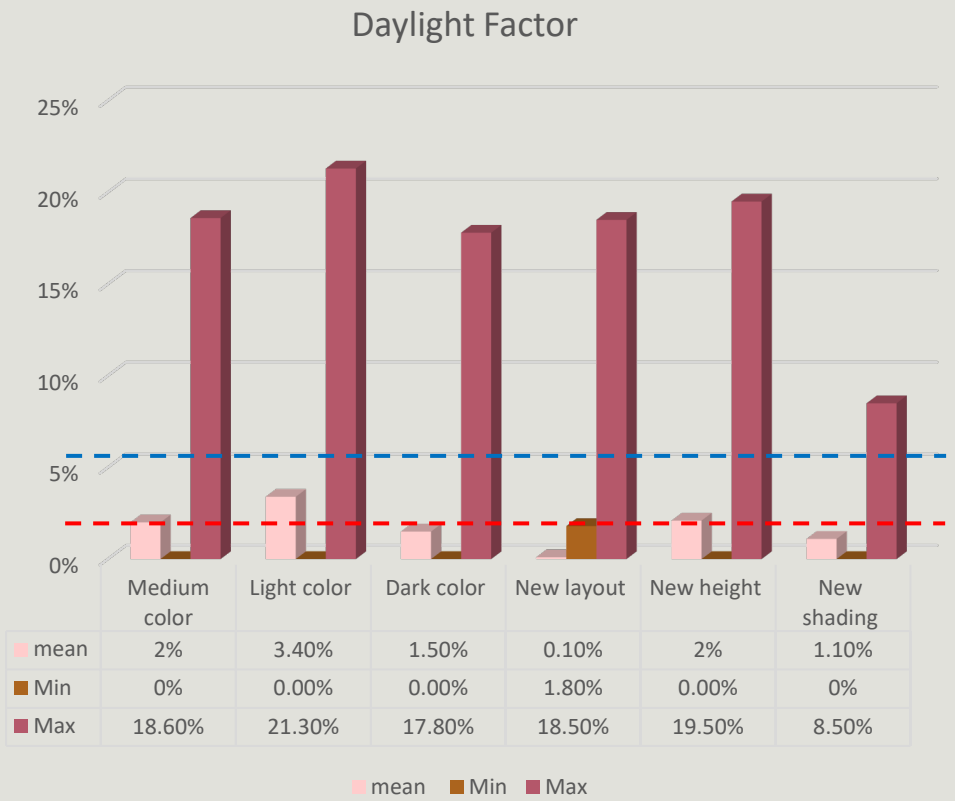
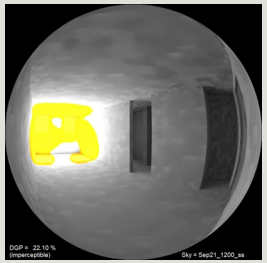


Daylight Glare Probability (DGP)



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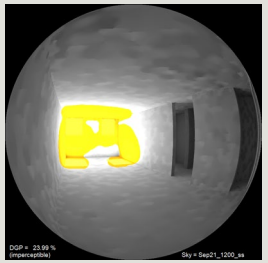
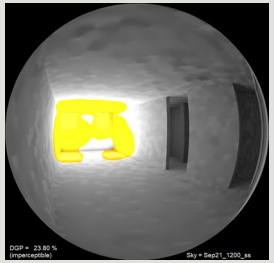
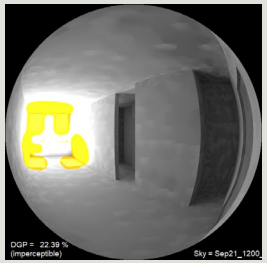


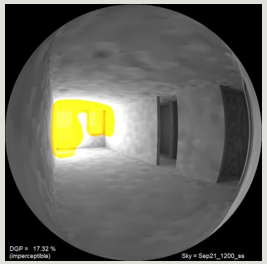
Bright



Dark



New Height



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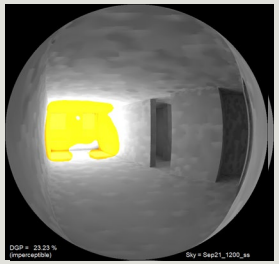
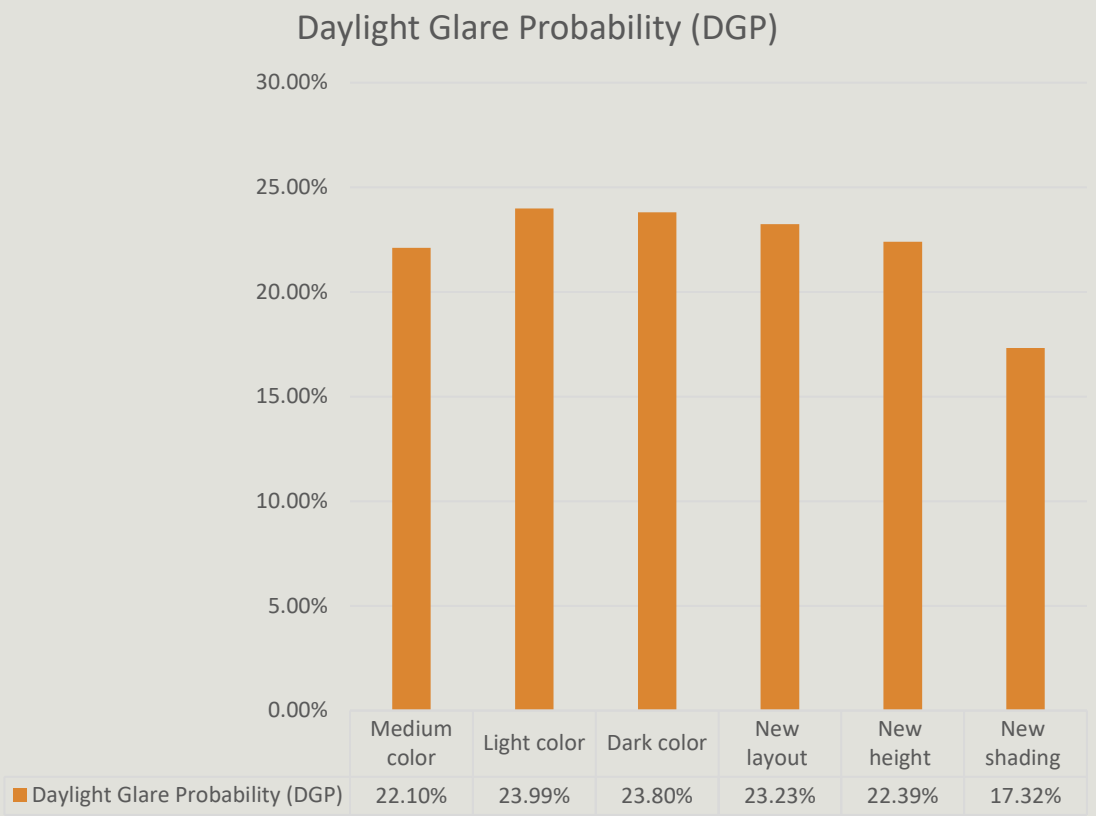
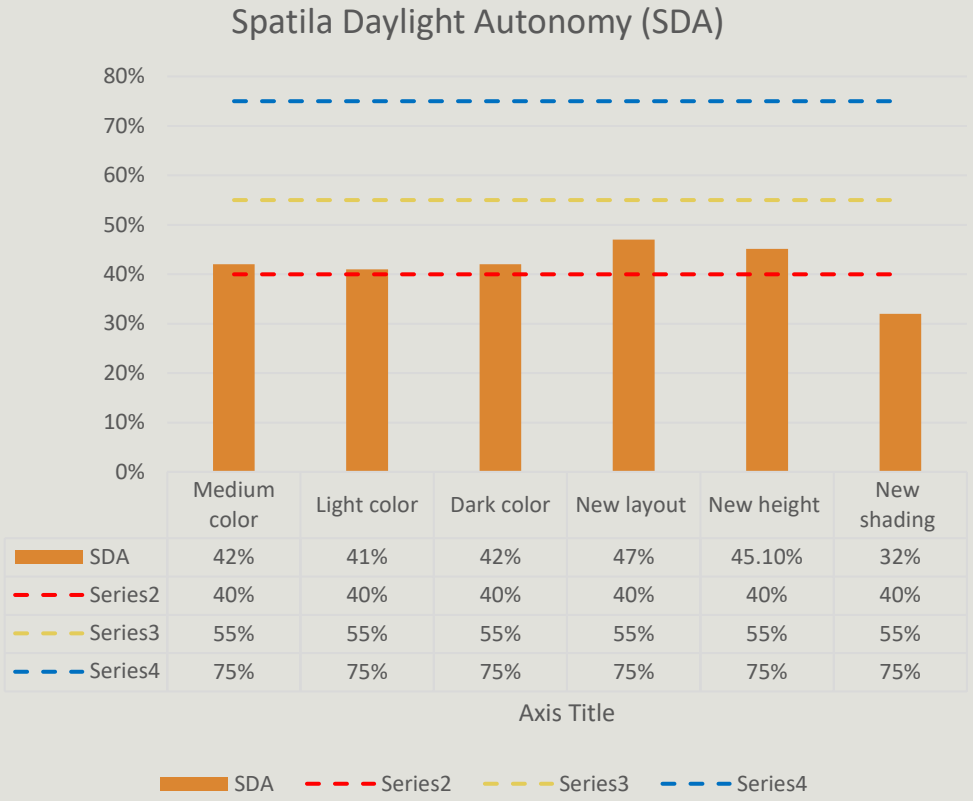


New layout

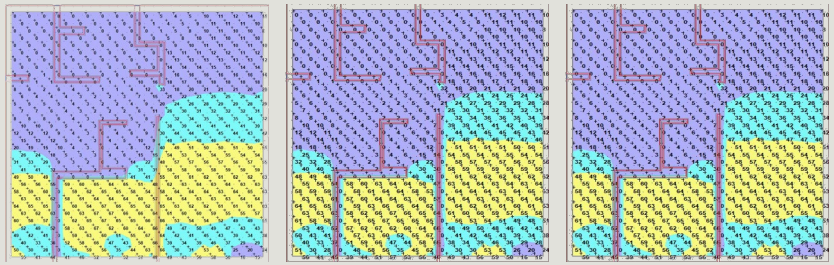


Daylight Performance (Spatial Daylight Autonomy)

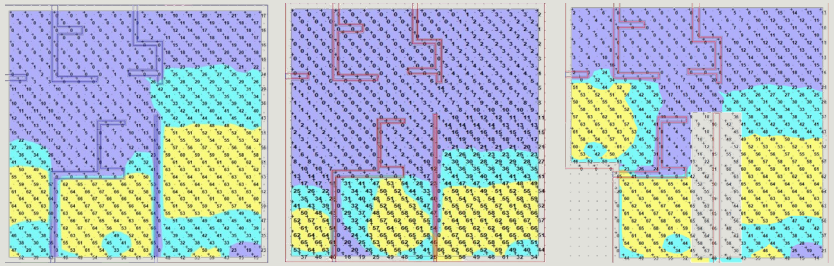


	Medium color	Light color	Dark color	New layout	New height	New shading
SDA	42%	41%	42%	47%	45.10%	32%
Series2	40%	40%	40%	40%	40%	40%
Series3	55%	55%	55%	55%	55%	55%
Series4	75%	75%	75%	75%	75%	75%

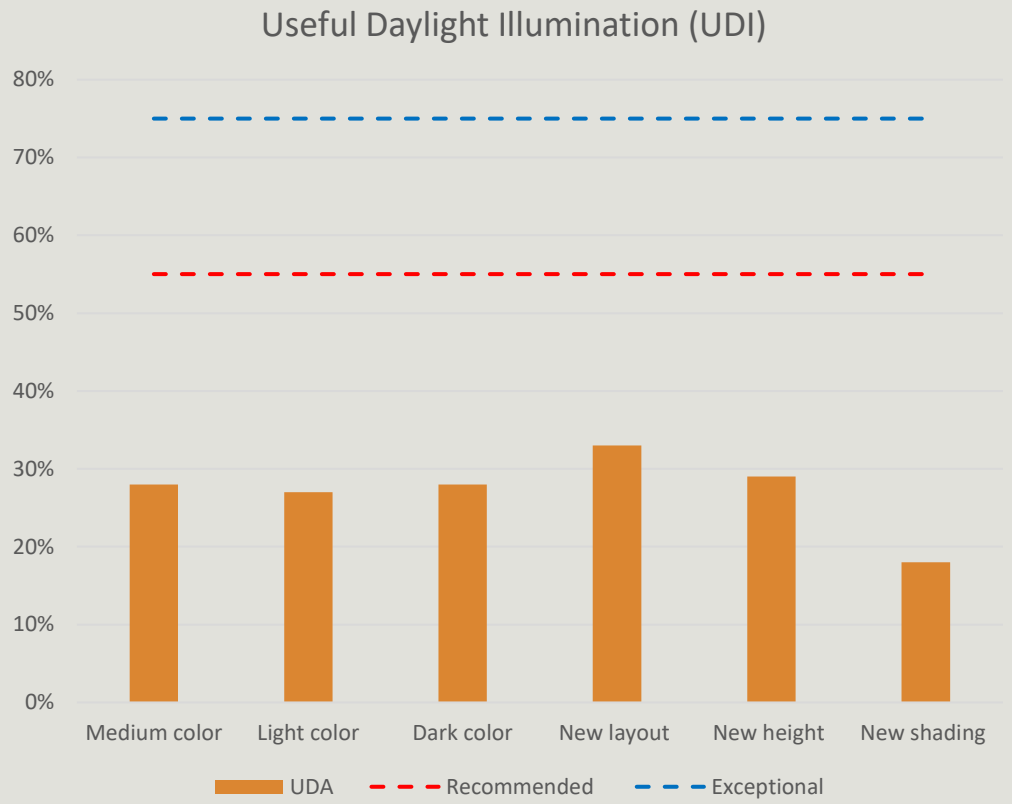
Daylight Performance (Useful Daylight Illuminance)



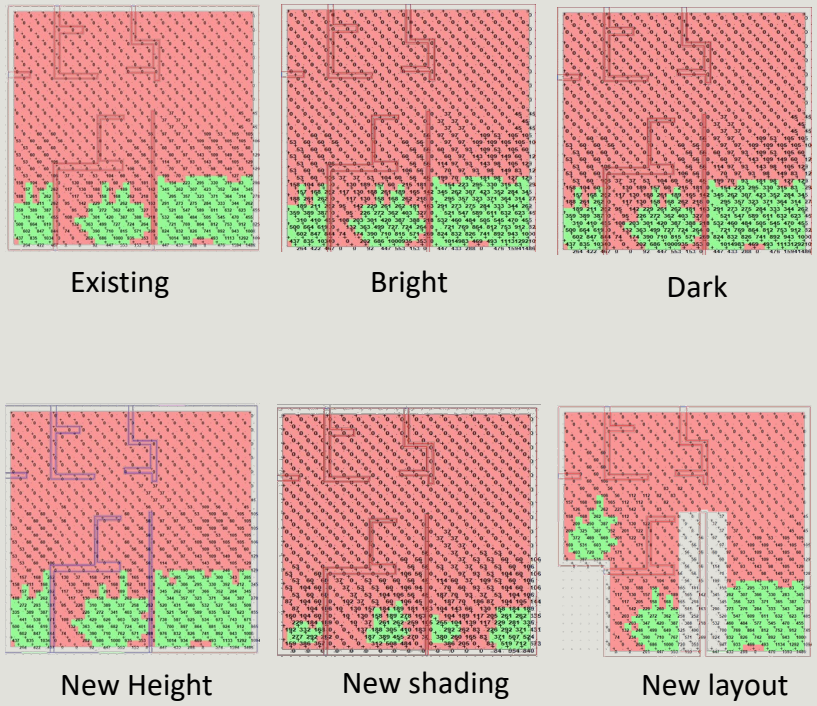
Existing | Bright | Dark

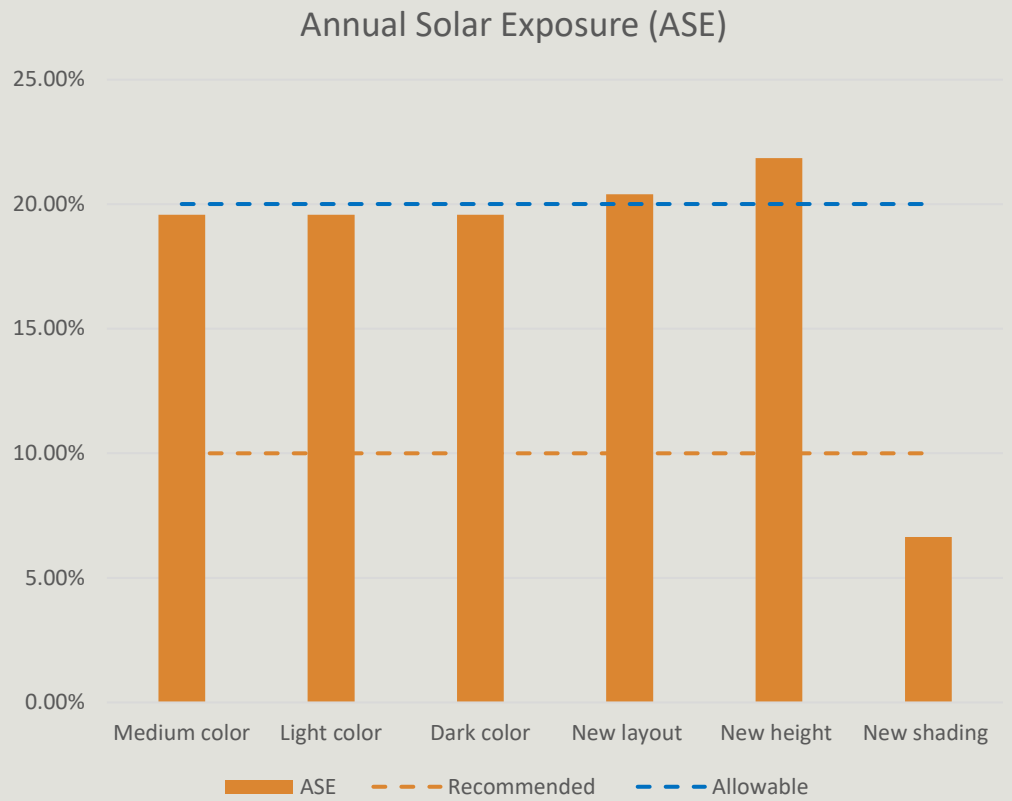


New Height | New shading | New layout



Daylight Performance (Annual Solar Exposure)

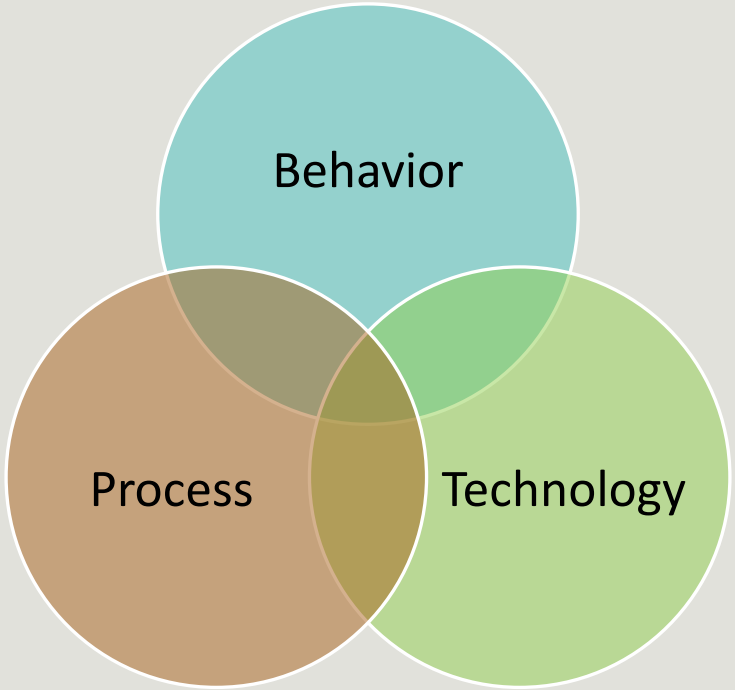




Lessons Learned

- The current status of the Salazar project is promising. Projects that have some deficiencies regarding the occupant's comfort can be improved by some simple cost-effective strategies.
- The process of designing, constructing, and operating sustainable affordable housing is integrated and requires education, early planning, and a multidisciplinary approach.
- Resources and research findings provide a great opportunity to investigate the best design strategies and metrics that not only impact the building performance but also occupant's performance and comfort.

Future Studies



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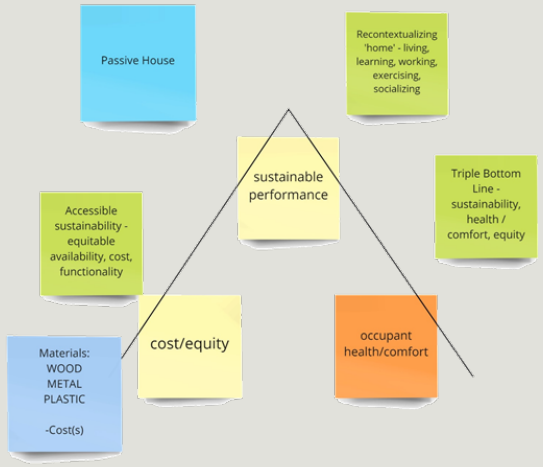

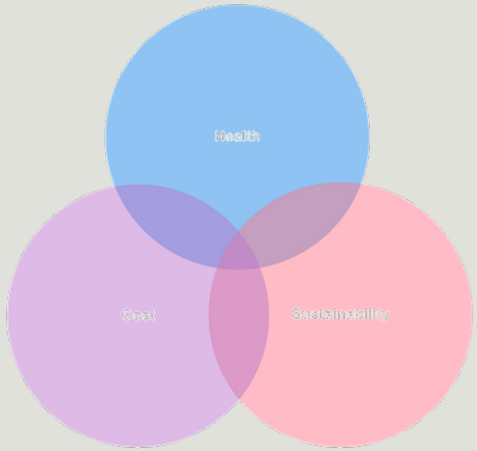

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