Jennifer Mers | Lighting/Electrical Option | Advisor: Dr. Moeck

Rio Hondo Library and Learning Resource Center

Senior Thesis | April 3, 2006 | Whittier, CA

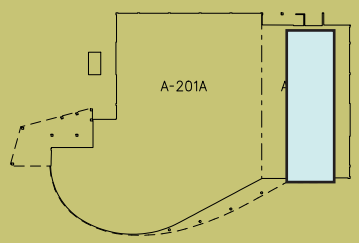
Rio Hondo Library and Learning Resource Center

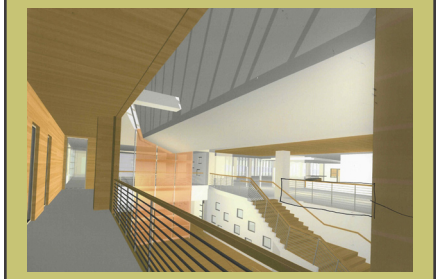
Location: Whittier, CA

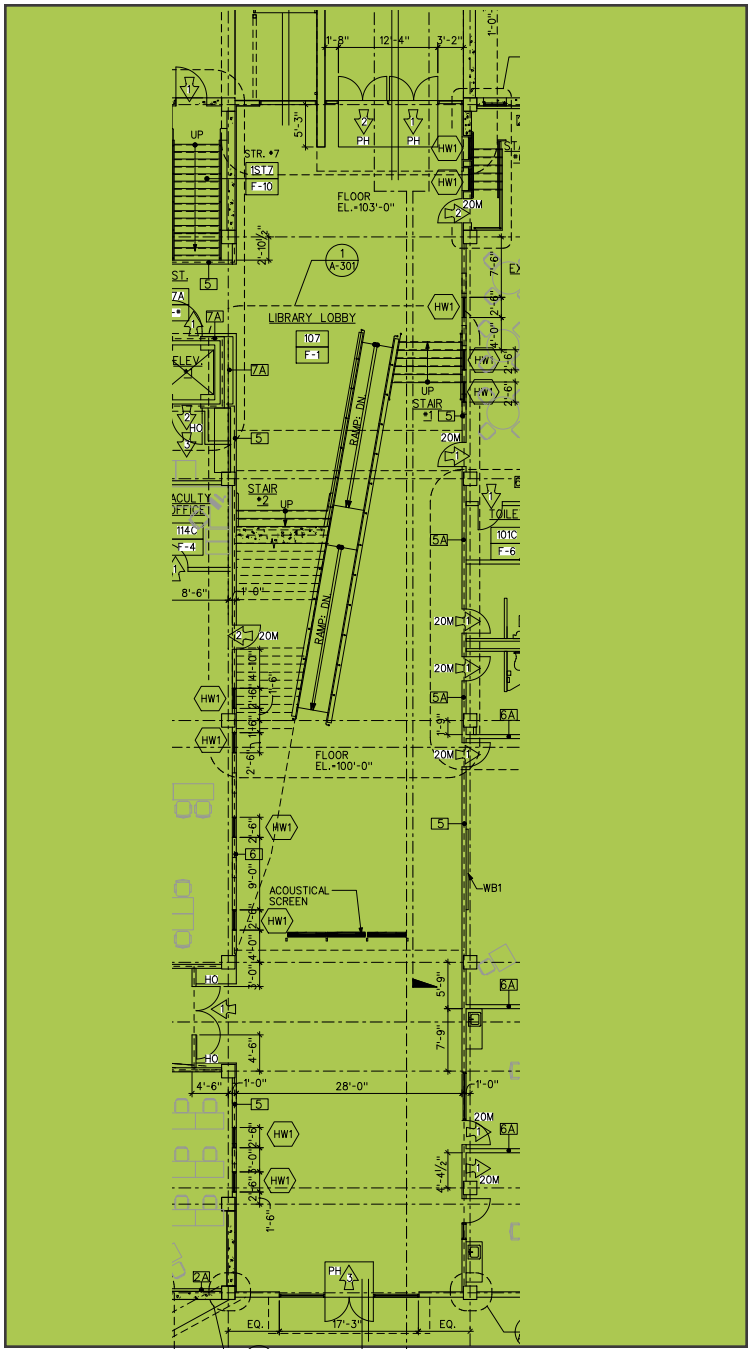
Building Size: 93,000 sq. ft, Two Stories

Function: Library and Learning Classrooms

Contents







Lobby

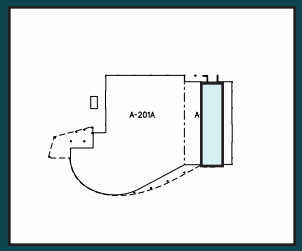
Overview

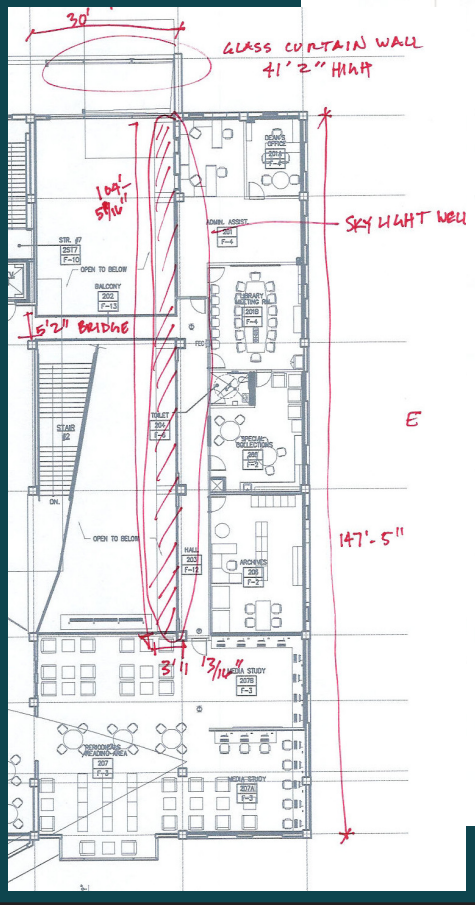
Main entrance to the building

Function: Circulation

Design Process

Realizing the problems





FUNCTION:
CIRCULATION
FIRST IMPRESSION
2 STORY ATRIUM

CANOPY EXTENDS INSIDE

ALL GLASS CURTAIN WALLS

MAIN STAIRWELL

EL. 103'-0"

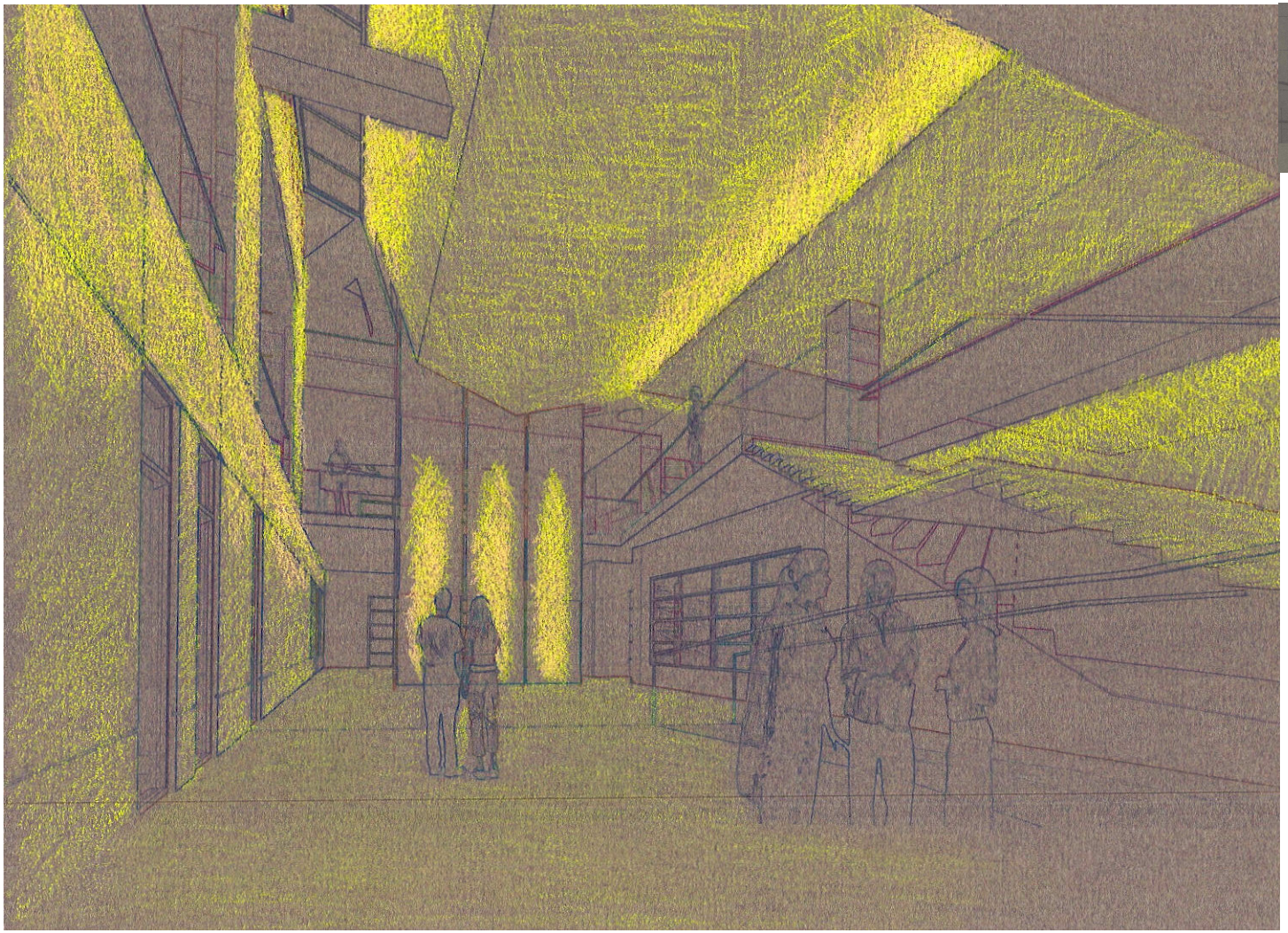
EL. 100'-0"

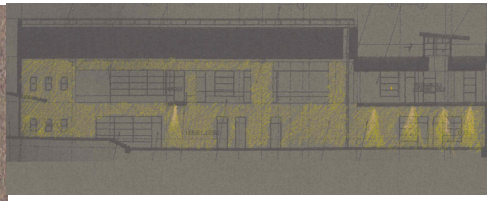
3 PANEL FOCUS

MEANT FOR GALLERY SPACE

DIFF ENVIR

30'





Main Goals

Comfort
Spaciousness
Warm
Inviting
Add highlight to the focal points

Create two different environments for different areas

Design Criteria

Horizontal Illuminance

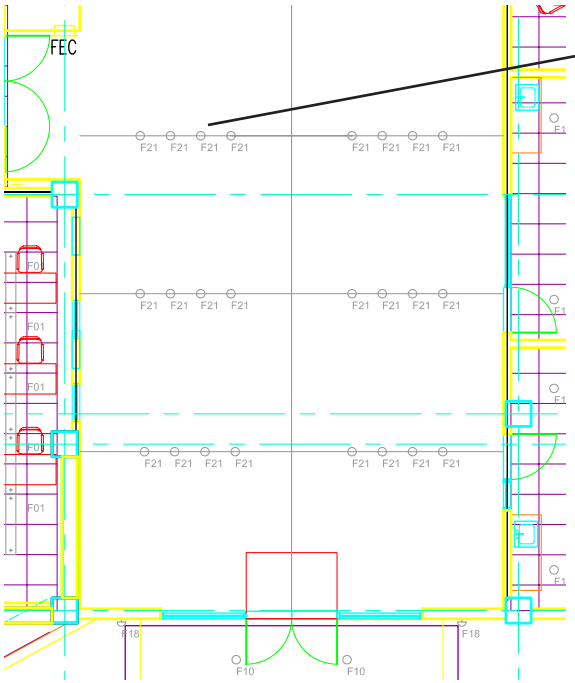
10 fc - floor plane

Vertical Illuminance

5 fc for wall illuminace

System control

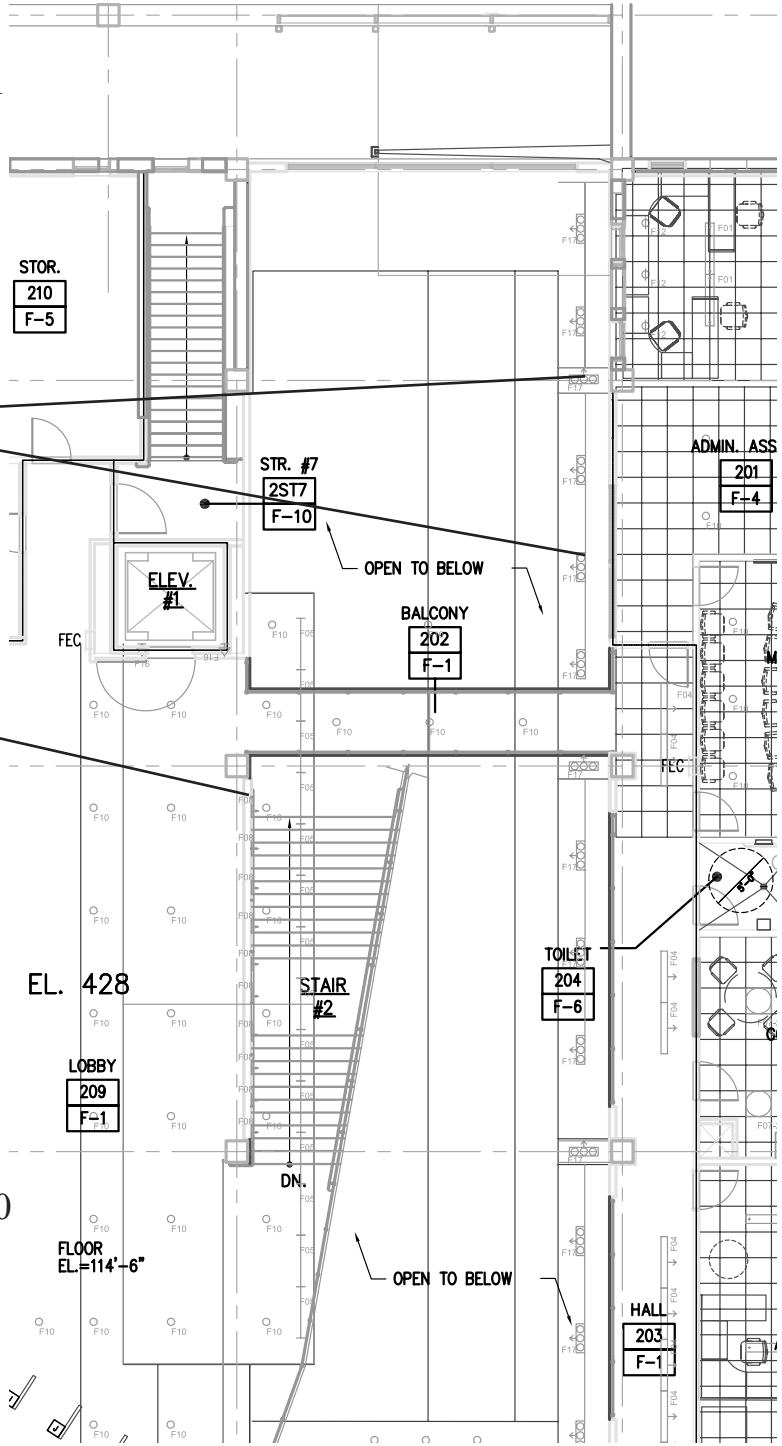
Schematic Design



F21

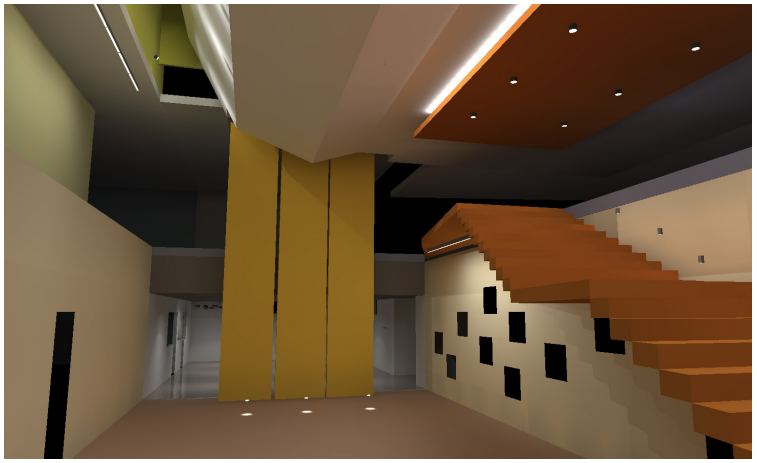
F17

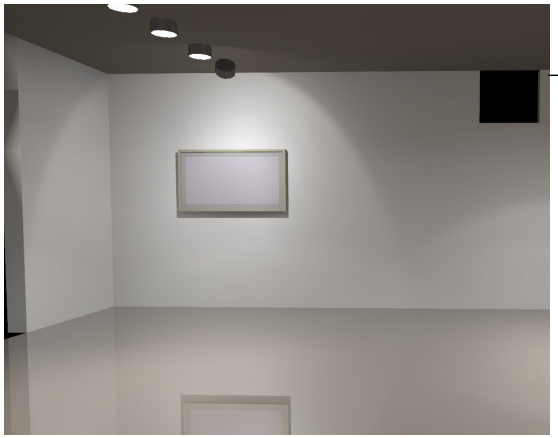
F08

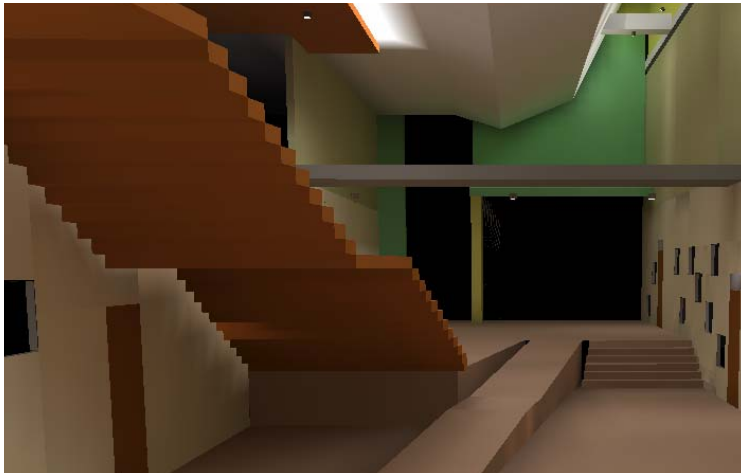


Power Density – Total Watts
Total Watts = 6819/4179 sq. ft = 1.63 *(0.2) Dimming Factor = 1.3

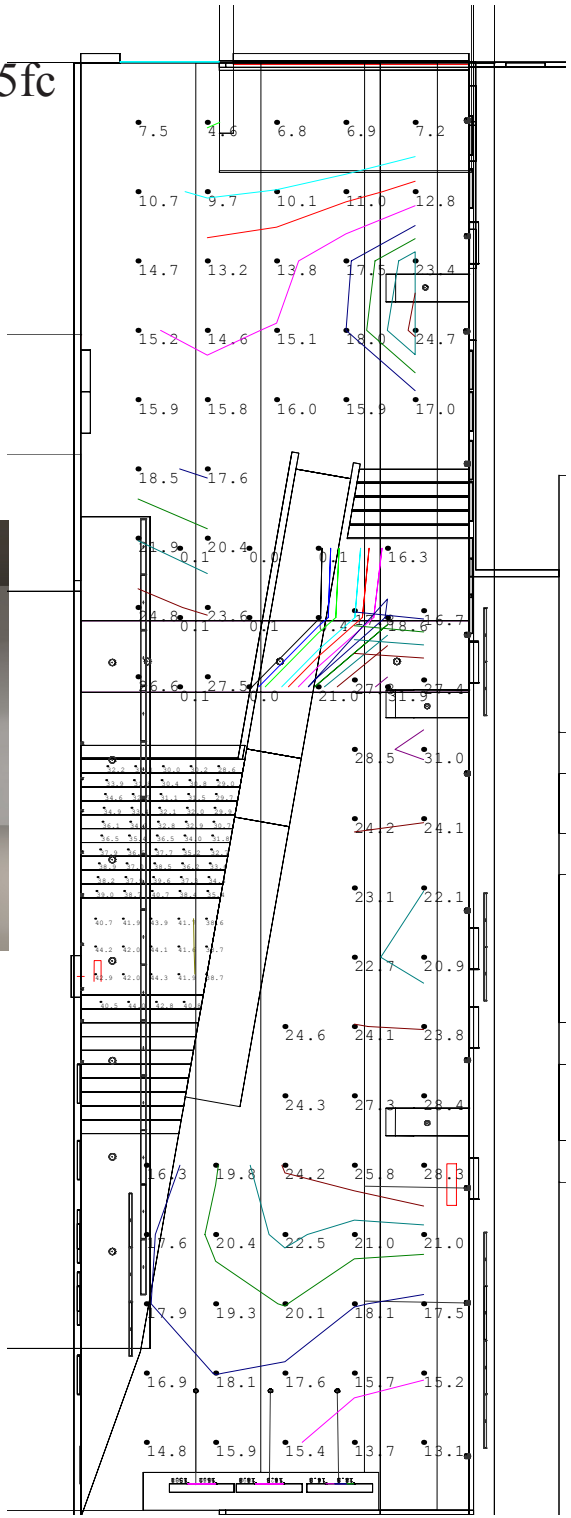
F04 Fluorescent – 28w (1) 28w T5– CRI 82 – CCT 3500
F05 Fluorescent Slot Light – 54w (1) T5HO – CRI 85 – CCT 3500
F08 Fluorescent Recessed Step Light – 20w (1) T9– CRI 85 – CCT 3500
F10 Fluorescent Recessed Downlight – 42w (1) CFL– CRI 82 – CCT 3500
F17 Halogen Recessed Adjustable – 50w (3) 50 wAR111– CRI 81 – CCT 3000
F21 Halogen Juno Track – 50w (1) 50W MR16– CRI 81 – CCT 3500



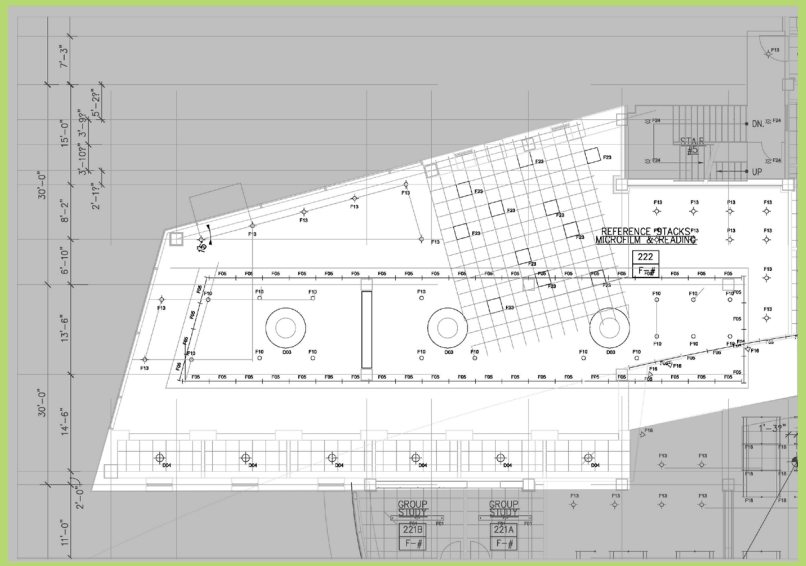




Average Floor Illuminance 15fc



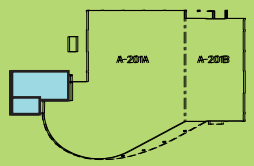
Microfilm and Reading Area



Overview

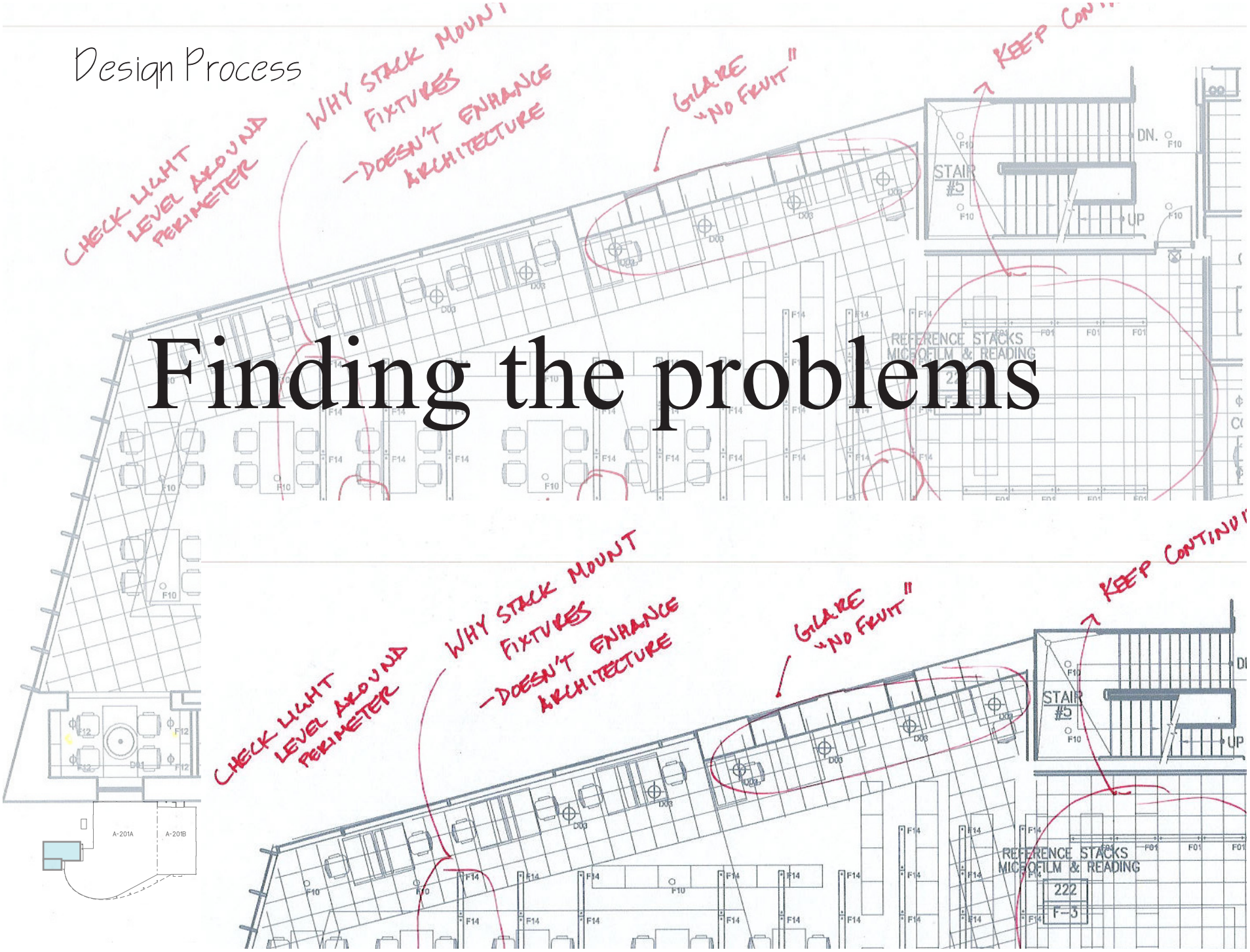
Study Area

Function: Reading

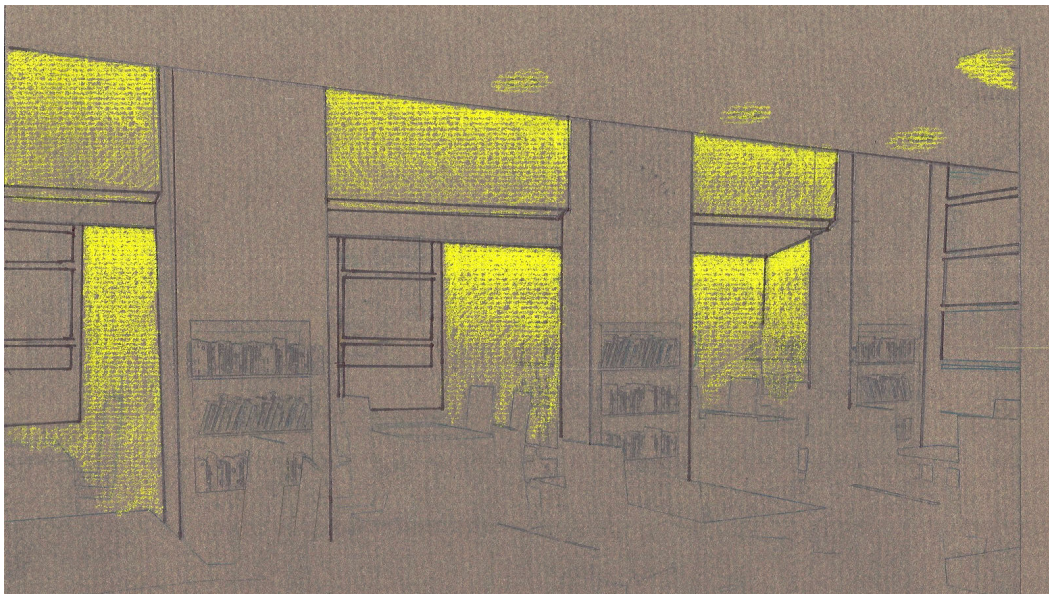


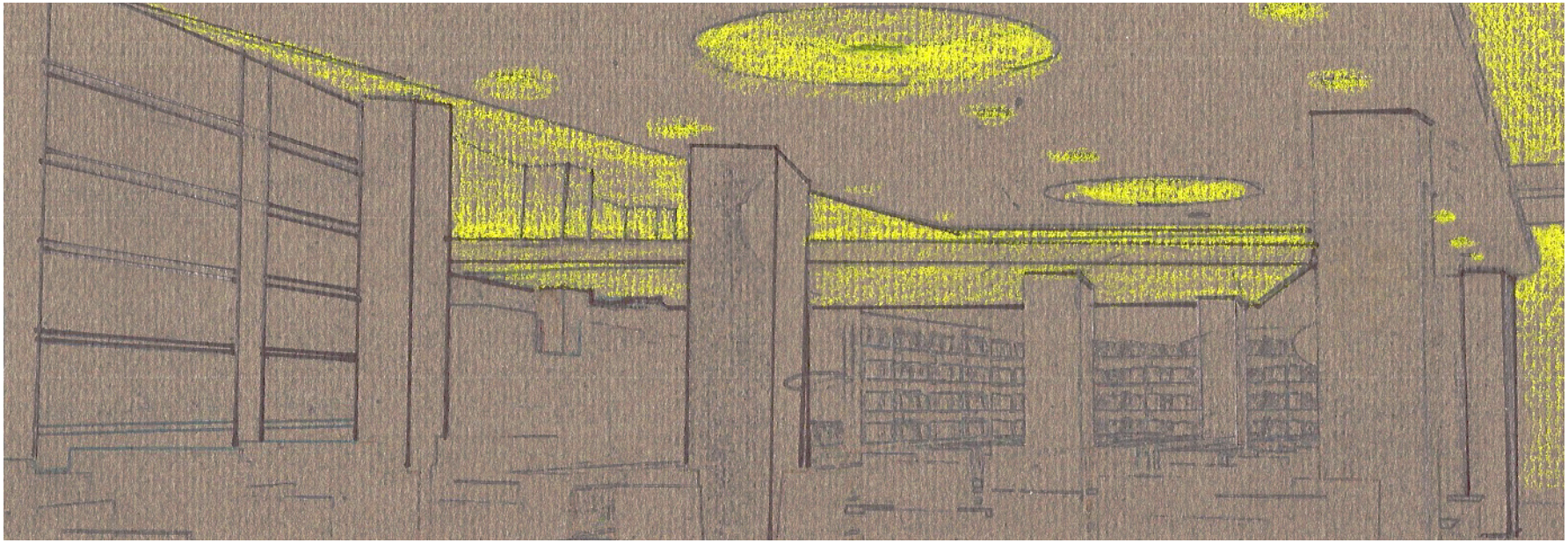
Design Process

Finding the problems



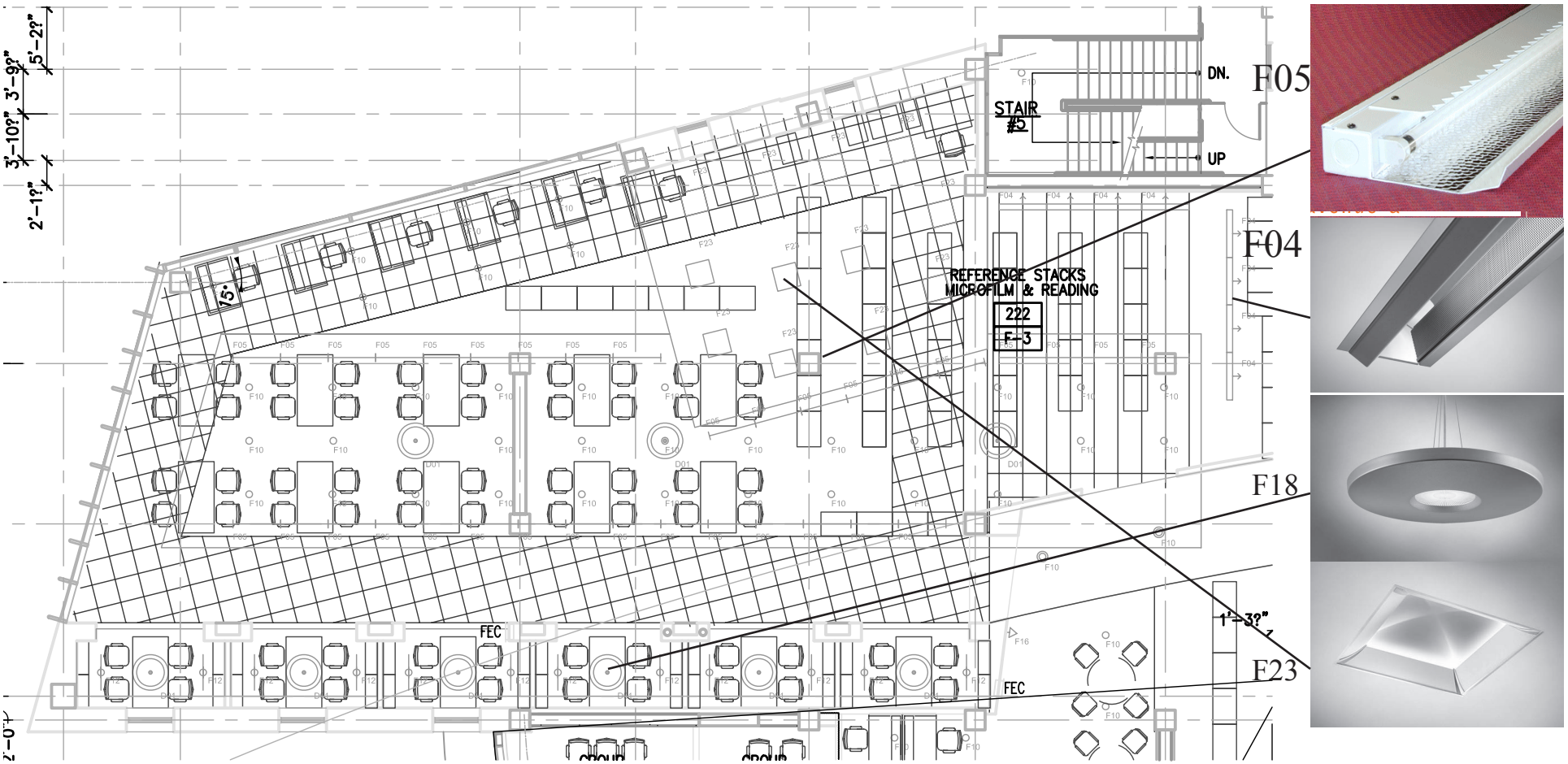
Schematic Design





Main Goals: Avoid Reflected Glare, Clean, Relaxed, Warm, Uniformity

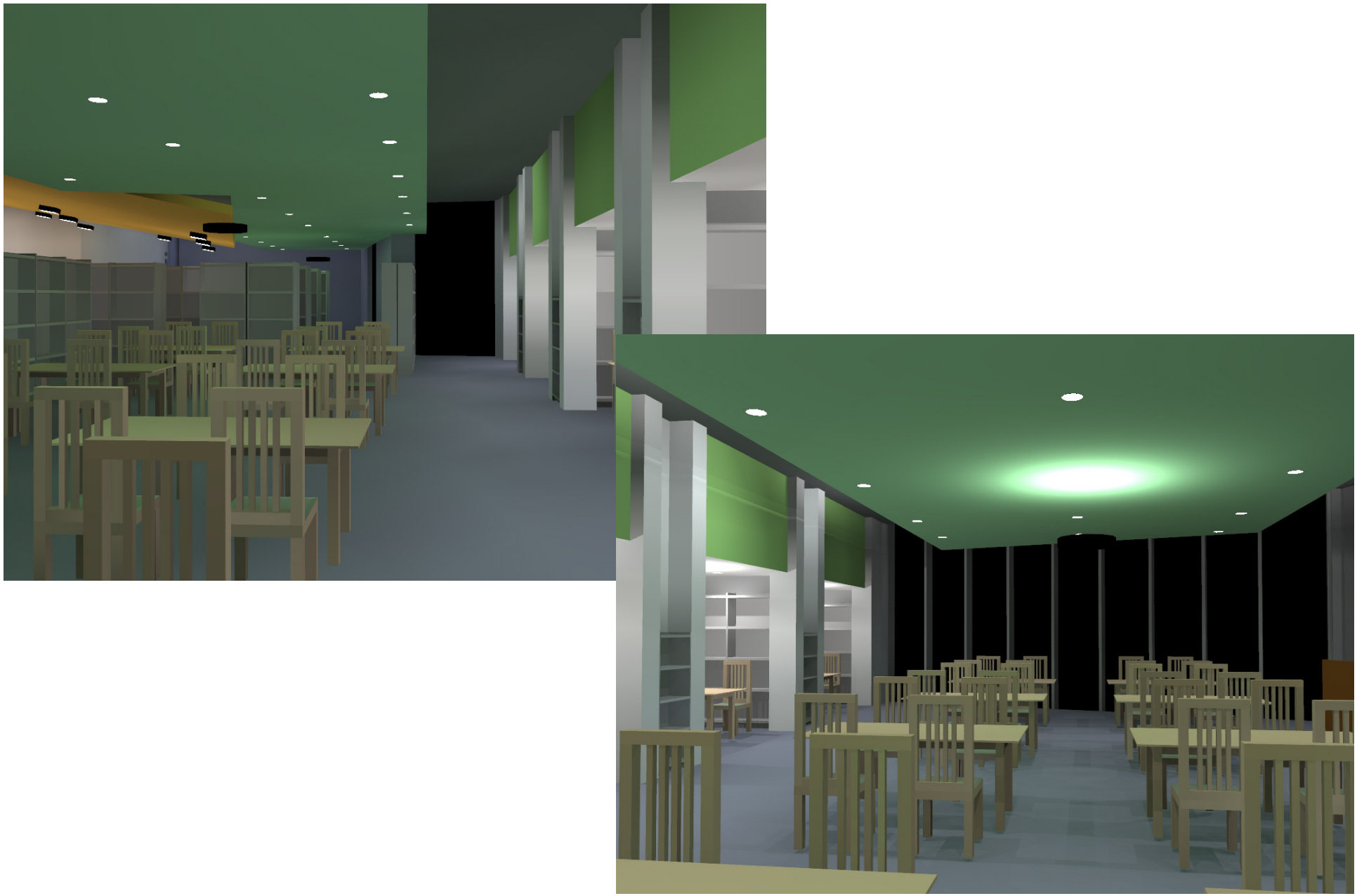
Design Criteria: Horizontal Illuminance 30 fc, Daylight Integration



F12 Fluorescent Recessed 6” Wallwash- 32w (1) 32w TT - CRI82 – CCT 3500
F18 Fluorescent Indirect Pendant- 42w (4) 42w TT- CRI82 – CCT 3500
F23 Fluorescent Recessed 2’x2’ Square- 14w (4) 14w T5- CRI82 – CCT 3500

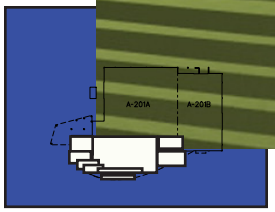
Power Density = Total watts / Area = 5625/3724 = 1.5 *(0.2) = 1.2 w/ sq. ft.

Renderings



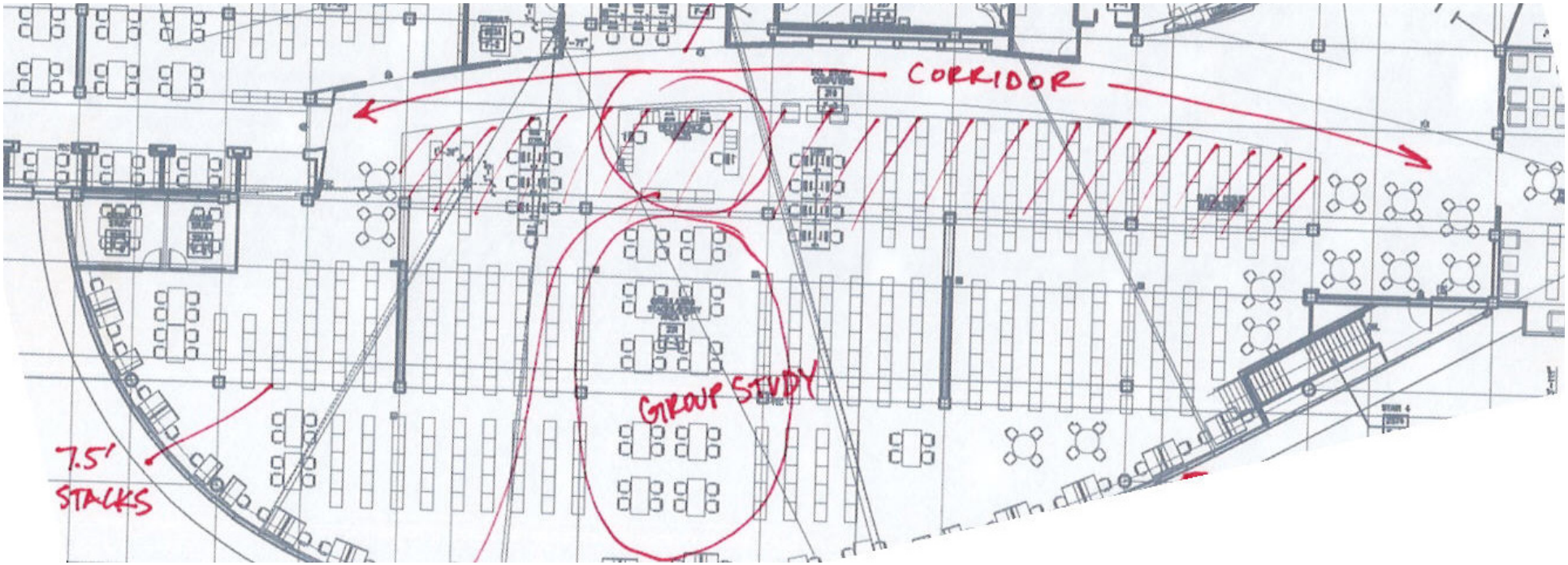
Library Stacks, Individual Desks, and Group Tables

Function: Library Stack Reading

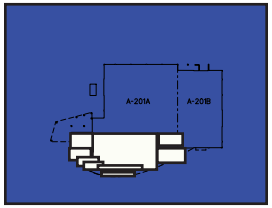


The Stack Area

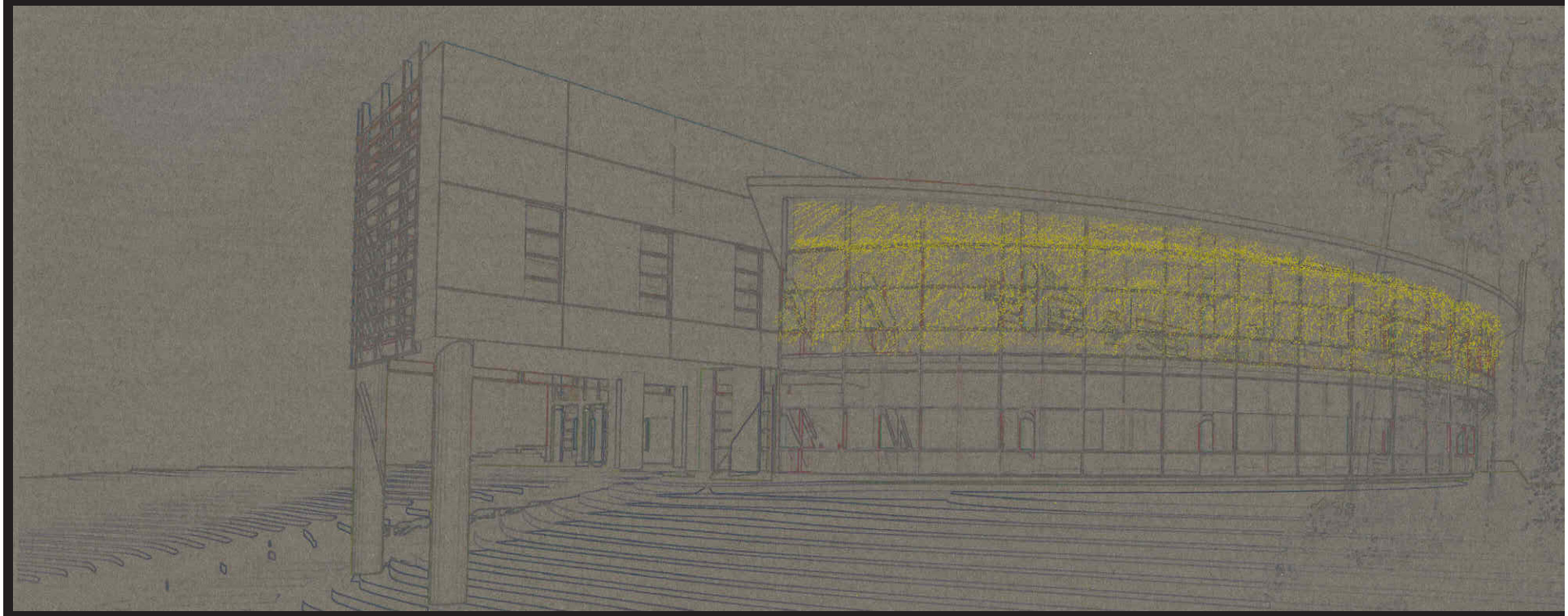
Design Process



Problems



Schematic Design

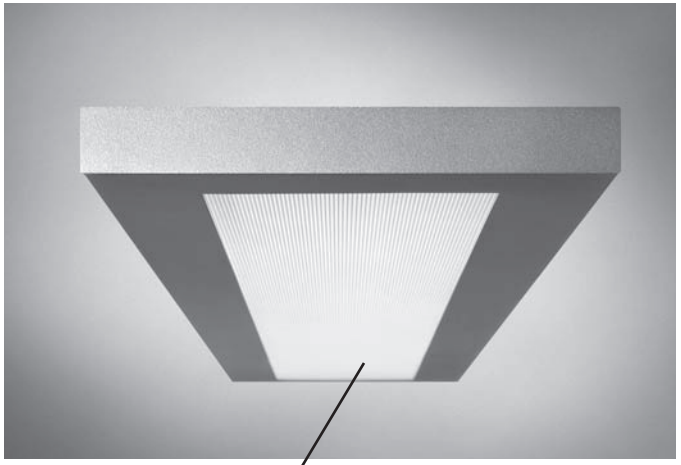


Design Criteria: Vertical Illuminance 10 fc to the bottom of the stack, Horizontal Illuminace 30 fc at the workplane

Main Goal: To shine forth like a beacon for the school

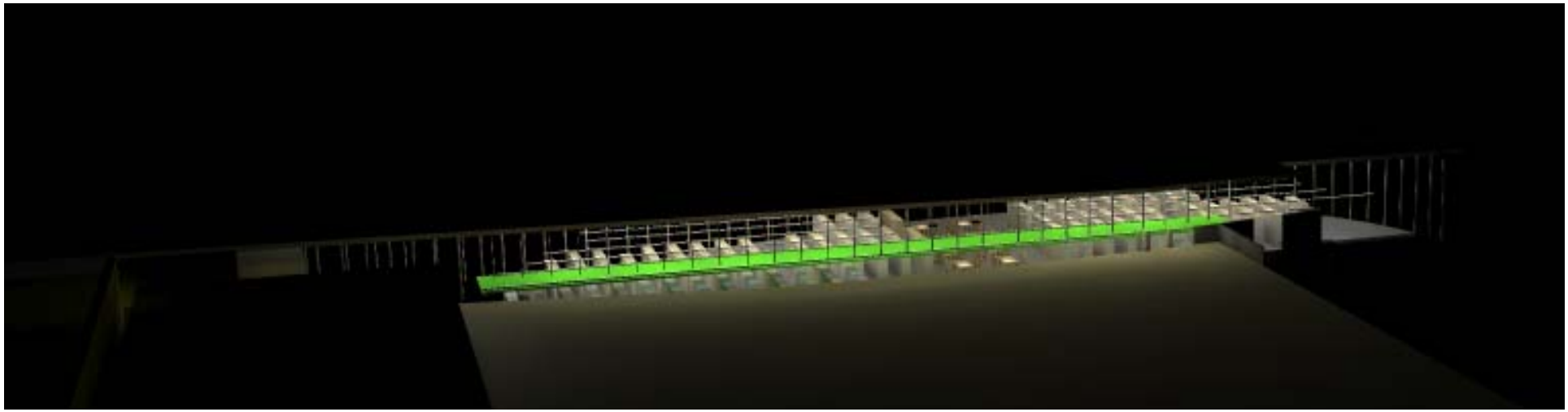
New Fixtures
D01 Fluorescent Decorative Pendant – 50w (4) 50w – CRI 82 – CCT 3500
F13 Surface Mounted Cylinder 6” – 42w (1) 42w TT - CRI 82 – CCT 3500
F14 Stack Light – Linear Pendant – 54w (2) 54w T5HO – CRI 85 – CCT 3500

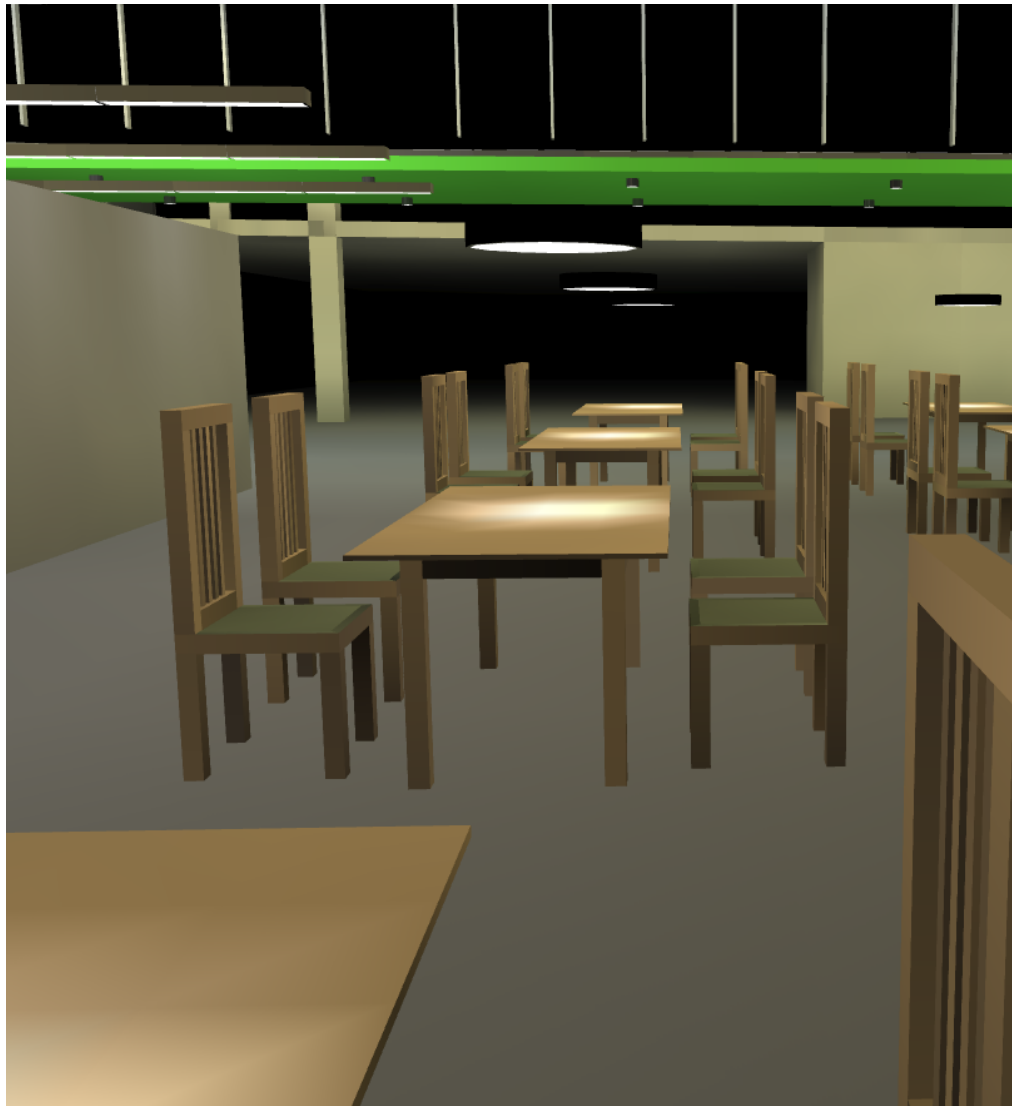
Power Density = Watts/ sq. ft = 23578 / 12411 = 1.89 * (0.2) = 1.5

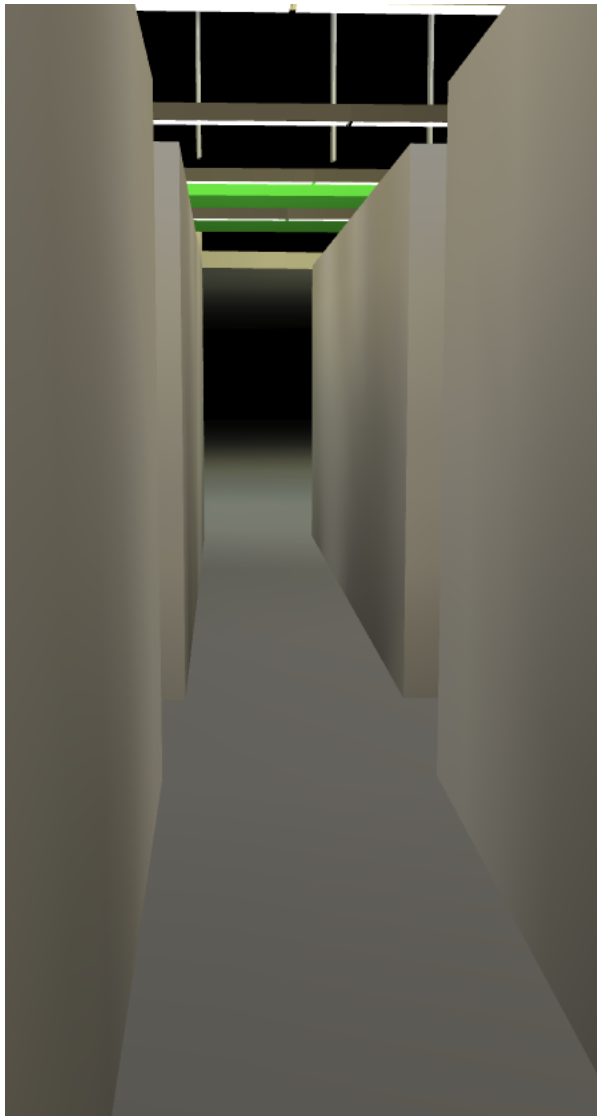


D01

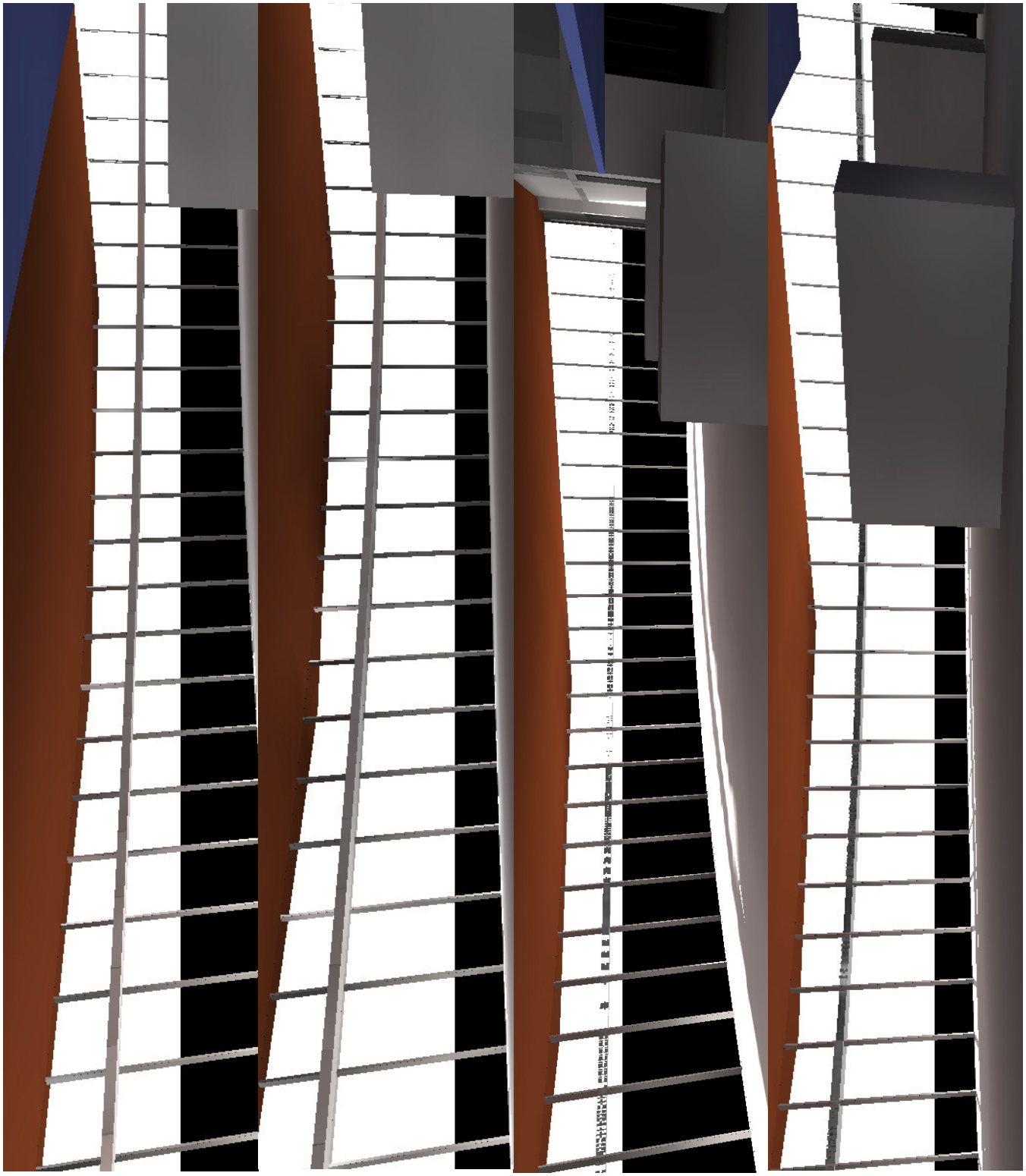
Renderings







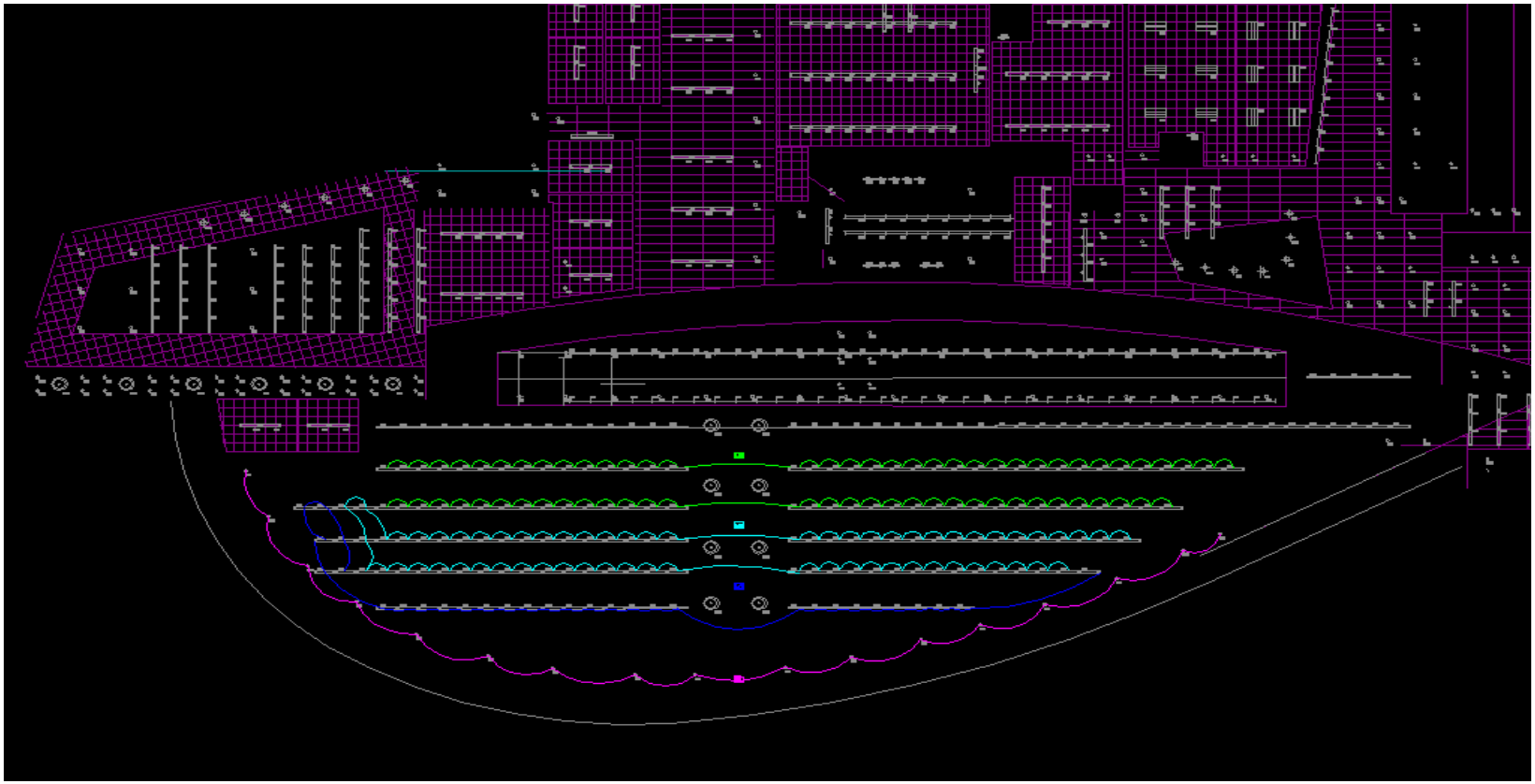
Daylight Analysis



Goal

To direct light as far back as possible into the space

With this shelf I was able to direct the daylight further into the space and therefore zone the electric lights accordingly.



Conclusions:

Lighting Design

- Creates a beacon for a the campus by having all surfaces lit
- Correct amount of light for tasks
- Provides control systems for daylighting

Daylighting

- Directs light further into space allowing more dimming

Thank you to

Mr. Ed Wunderly
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Professors
Dr. Moeck
Dr. Mistrick

And to all friends, family, and fellow AE’s